



Metis Health Knowledge Authority in Manitoba

Depression, Anxiety Disorders, and Related Health Care Utilization in the Manitoba Metis Population

Winnipeg, Manitoba, Canada 2013



Manitoba Metis Federation –
Health & Wellness Department

Authors:

Julianne Sanguins, RN, PhD
Judith G. Bartlett, MD, MSc, CCFP
Sheila Carter, Director
Nathan Hoepfner, MA
Punam Mehta, MSc
Mena Bassily, MD, MSc

Publication Information

Published by the Manitoba Metis Federation - Health & Wellness Department (MMF-HWD), 2013. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the proper written permission of the publisher.

How to cite this publication:

Sanguins, J., Bartlett, J., Carter, S., Hoepfner, N., Mehta, P., & Bassily, M. (2013). *Depression, anxiety disorders, and related health care utilization in the Manitoba Metis population*. Winnipeg, MB: Manitoba Metis Federation.

Additional copies of this report can be downloaded from the MMF-HWD website:

<http://health.mmf.mb.ca>

Health & Wellness Department
Manitoba Metis Federation
Room 201 – 150 Henry Avenue
Winnipeg Manitoba R3B 0J7
Telephone: (204) 586-8474

Acknowledgments

The Manitoba Metis Federation Health & Wellness Department wishes to thank the following individuals and organizations for their role in the production of this report:

President and Board of Directors (Manitoba Metis Federation) for their ongoing support

Funding for this publication was provided by the Public Health Agency of Canada
Cette publication a été réalisée grâce au financement de l'Agence de la santé publique du Canada

Network Environments for Aboriginal Health Research (NEAHR) also provided funding and support to this project

Manitoba Centre for Health Policy for use and analysis of data contained in the Population Health Research Data Repository under project H2010:421 (HIPC #2010/2011-52). Data used in this study are from the Population Health Research Data Repository housed at the Manitoba Centre for Health Policy, University of Manitoba and were derived from data provided by Manitoba Health. Specifically, we would like to thank Dr. Patricia Martens, Charles Burchill, Hui Chen, Heather Prior and Angela Bailly for their assistance with this project.

Manitoba Health for linkage with Personal Health Insurance Numbers (PHIN)

Aggregated Diagnosis Groups™ (ADGs™) codes for risk adjustment in logistic models were created using The John Hopkins Adjusted Clinical Group® (ACG®) Case-Mix System version 9

External Peer Reviewers for their input

Loni Cheng Research Assistant in the MMF-HWD for review and editing

All data management, programming and analyses were performed using SAS® version 9.

Disclosure

The results and conclusions in this report are those of the authors and no official endorsement by the Public Health Agency of Canada, Network Environments for Aboriginal Health Research (NEAHR), Manitoba Health, or other parties is intended or should be inferred. The views expressed herein do not necessarily represent the views of the University of Manitoba Network Environments in Aboriginal Health Research (NEAHR) program.

In our study, data was coded to protect the identification of study participants. All data comes from an administrative database with identifying information of both patients and health care providers removed. In addition, there was no contact with patients or providers during any part of this study. The intent of these analyses was to examine patterns among groups based on Metis ethnicity and on different geographical divisions.

For the purposes of this particular study we obtained approvals from the Manitoba Metis Federation to access the Metis Population Database, the Faculty of Medicine's Research Ethics Board at the University of Manitoba for approval of our research design and activities, and the Manitoba Government's Health Information Privacy Committee to access the Population Health Research Data Repository.

Table of Contents

Table of Contents	v
List of Figures.....	vii
List of Tables	xi
Executive Summary.....	xii
Section 1: Introduction and Methods	1
1.1 Background of this Report	1
1.1.1 Definition of Depression and/or Anxiety Disorders.....	2
1.1.2 Acronyms	2
1.2 Background of the Research Team	3
1.3 Purpose of this Report and Outline of the Sections	4
1.4 What is in the Report? Types of Graphs, Tables, and Analyses.....	4
1.5 How to Read this Report.....	5
1.5.1 Geographical distribution of the MMF Regions, RHAs, and Winnipeg CAs. 6	
1.5.2 Making Sense of the Graphs	8
1.6 Methods Used in This Report.....	14
1.7 Datasets Used in This Research.....	14
1.8 How was the Cohort Created?.....	15
1.9 Data Production and Analysis.....	16
1.9.1 Generation of Rates	16
1.9.2 Crude and Adjusted Rates.....	16
1.9.3 Prevalence and Incidence Rates	17
1.9.4 Logistic Regression Modeling.....	17
1.10 Data Interpretation.....	19
1.11 Limitations	19
1.12 Summary	20

Section 2: Overview of the MMF—Health & Wellness Department.....	23
2.1 Introduction.....	23
2.2 The Metis	23
2.3 The Manitoba Metis Federation	23
2.4 Manitoba Metis Federation - Health & Wellness Department	26
2.5 Description of a Culturally Coherent Metis Methodology or Lens for Wellness	26
2.5.1 Ways of Knowing.....	26
2.6 Knowledge Translation.....	30
Section 3: Demographics and Mortality.....	33
3.1 Age Profile of Manitoba	33
3.2 Premature Mortality Rate.....	38
Section 4: Morbidity	47
Overall Key Findings.....	48
4.1 Prevalence of Depression	50
4.2 Prevalence of Anxiety Disorders	59
4.3 Prevalence of Depression and/or Anxiety Disorders	67
4.4 Prevalence of Substance Abuse	77
4.5 Prevalence of Suicide Attempts or Completions	87
Section 5: Health Services Use	99
Overall Key Findings.....	100
5.1 All-Cause Ambulatory Visits	102
5.2 Ambulatory Visits for Depression and/or Anxiety Disorders.....	111
5.3 Psychiatrist Visits for Depression and/or Anxiety Disorders.....	118
5.4 Hospital Separations for All Causes.....	124
5.5 Hospital Separations due to Depression and/or Anxiety Disorders	132
5.6 Antidepressant Use.....	140
Glossary	149

List of Figures

Section 1: Introduction and Methods

Figure 1.5.1: Geographical distribution of the MMF Regions, RHAs, and Winnipeg Community Areas.....	6
---	---

Section 2: Overview of the Manitoba Metis Federation - Health & Wellness Department

Figure 2.3.1: Villages, Towns, Cities, and Unorganized Territories Where Metis Live in Manitoba, 2009.....	24
Figure 2.5.1: Holistic Research Model.....	27
Figure 2.5.2: MMF - HWD Strategies	27
Figure 2.5.3: Metis Life Promotion Framework© Determinants of Life.....	28
Figure 2.5.4: Wellness Areas©.....	28
Figure 2.5.5: Wellness Model for Examining Depression and/or Anxiety Disorders	29

Section 3: Demographics of the Study Population

Figure 3.1.1: Population Pyramid of Metis and All Other Manitobans, 2006.....	36
Figure 3.1.2: Population Pyramid of Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2006.....	36
Figure 3.2.1: Premature Mortality Rate by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002-2006	40
Figure 3.2.2: Premature Mortality Rate by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002-2006	40
Figure 3.2.3: Premature Mortality Rate by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002-2006	42

Section 4: Morbidity Profile

Figure 4.1.1: Prevalence of Depression by RHA for Metis and All Other Manitobans, 2002/03-2006/07	53
Figure 4.1.2: Prevalence of Depression by Winnipeg Community Area for Metis and All Other Manitobans, 2002/03-2006/07.....	53
Figure 4.1.3: Prevalence of Depression in Manitoba by Age and Sex for Metis and All Other Manitobans, 2002/03-2006/07.....	54
Figure 4.1.4: Prevalence of Depression by Income Quintile in Manitoba for Metis and All Other Manitobans, 2002/03-2006/07.....	56

Figure 4.2.1:	Prevalence of Anxiety Disorders by RHA for Metis and All Other Manitobans, 2002/03-2006/07	61
Figure 4.2.2:	Prevalence of Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans, 2002/03-2006/07.....	61
Figure 4.2.3:	Prevalence of Anxiety Disorders in Manitoba by Age and Sex for Metis and All Other Manitobans, 2002/03-2006/07.....	62
Figure 4.2.4:	Prevalence of Anxiety Disorders by Income Quintile in Manitoba for Metis and All Other Manitobans, 2002/03-2006/07.....	64
Figure 4.3.1:	Prevalence of Depression and/or Anxiety Disorders by RHA for Metis and All Other Manitobans, 2002/03-2006/07.....	69
Figure 4.3.2:	Prevalence of Depression and/or Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans, 2002/03-2006/07.....	69
Figure 4.3.3:	Prevalence of Depression and/or Anxiety Disorders in Manitoba by Age and Sex for Metis and All Other Manitobans, 2002/03-2006/07.....	70
Figure 4.3.4:	Prevalence of Depression and/or Anxiety Disorders by Income Quintile in Manitoba for Metis and All Other Manitobans, 2002/03-2006/07.....	72
Figure 4.4.1:	Prevalence of Substance Abuse by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	80
Figure 4.4.2:	Prevalence of Substance Abuse by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	80
Figure 4.4.3:	Prevalence of Substance Abuse in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07.....	81
Figure 4.4.4:	Prevalence of Substance Abuse by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	82
Figure 4.5.1:	Prevalence of Attempted or Completed Suicides by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 1997-2006	89
Figure 4.5.2:	Prevalence of Attempted or Completed Suicides by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	89
Figure 4.5.3:	Prevalence of Attempted or Completed Suicides by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 1997-2006	90

Section 5: Health Services Use

Figure 5.1.1:	All-Cause Ambulatory Visit Rate by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	104
---------------	---	-----

Figure 5.1.2:	All-Cause Ambulatory Visit Rate by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	104
Figure 5.1.3:	All-Cause Ambulatory Visit Rate in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	105
Figure 5.1.4:	All-Cause Ambulatory Visit Rate by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	106
Figure 5.1.5:	Ambulatory Visits by Cause (ICD-9 CM) in Manitoba for Metis with Depression and/or Anxiety Disorders in Manitoba, 2002/03-2006/07	108
Figure 5.1.6:	Ambulatory Visits by Cause (ICD-9 CM) for All Other Manitobans with Depression and/or Anxiety Disorders in Manitoba, 2002/03-2006/07	108
Figure 5.2.1:	Ambulatory Visit Rate for Depression and/or Anxiety Disorders by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	113
Figure 5.2.2:	Ambulatory Visit Rate for Depression and/or Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	113
Figure 5.2.3:	Ambulatory Visit Rate for Depression and/or Anxiety Disorders in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	114
Figure 5.2.4:	Ambulatory Visit Rate for Depression and/or Anxiety Disorders by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	116
Figure 5.3.1:	Psychiatrist Visit Rate due to Depression and/or Anxiety Disorders by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	120
Figure 5.3.2:	Psychiatrist Visit Rate due to Depression and/or Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	120
Figure 5.3.3:	Psychiatrist Visit Rate due to Depression and/or Anxiety Disorders in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	121
Figure 5.3.4:	Psychiatrist Visit Rate due to Depression and/or Anxiety Disorders by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	122
Figure 5.4.1:	All-Cause Hospital Separation Rate by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	126

Figure 5.4.2:	All-Cause Hospital Separation Rate by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	126
Figure 5.4.3:	All-Cause Hospital Separation Rate in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	127
Figure 5.4.4:	All-Cause Hospital Separation Rate by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	128
Figure 5.4.5:	Hospital Separations by Cause (ICD-9 CM) for Metis with Depression and/or Anxiety Disorders, 2002/03-2006/07	130
Figure 5.4.6:	Hospital Separations by Cause (ICD-9 CM) for All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	130
Figure 5.5.1:	Hospital Separation Rate due to Depression and/or Anxiety Disorders by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	135
Figure 5.5.2:	Hospital Separation Rate due to Depression and/or Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	135
Figure 5.5.3:	Hospital Separation Rate due to Depression and/or Anxiety Disorders in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	136
Figure 5.5.4:	Hospital Separation Rate due to Depression and/or Anxiety Disorders by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	138
Figure 5.6.1:	Rate of Prescription of Antidepressants by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	142
Figure 5.6.2:	Rate of Prescription of Antidepressants by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	142
Figure 5.6.3:	Rate of Prescription of Antidepressants in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	143
Figure 5.6.4:	Rate of Prescription of Antidepressants by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07	144

List of Tables

Section 2: Overview of the Manitoba Metis Federation-Health & Wellness Department

Table 2.5.1: Wellness Areas© Question Type 29

Table 2.6.1: Knowledge Networks - MMF Regions with RHAs 30

Section 3: Age and Sex Characteristics of a Population

Table 3.2.1 Premature Mortality Rate in Manitoba by Sex for Metis and All Other Manitobans, 2002-2006..... 41

Section 4: Morbidity

Table 4.0: Overall Key Findings of Morbidity Indicators..... 49

Table 4.3.1: Logistic Regression Modeling of the possible predictors of Depression and/or Anxiety Disorders Diagnosis, 2002/03-2006/07..... 74

Figure 4.4.1: Logistic Regression Modeling of the possible predictors of Substance Abuse Diagnosis, 2002/03-2006/07..... 84

Figure 4.5.1: Logistic Regression Modeling of the possible predictors of Suicide Completions or Attempts, 2002/03-2006/07 92

Section 5: Health Services Use

Table 5.0: Overall Key Findings of Health Services Use Indicators 101

Executive Summary

This report resulted from the need to understand further the findings in the Metis Health Status & Health Services Utilization Study (also known as the Metis Atlas) (Martens, Bartlett, et al., 2010). In that study, prevalence of depression in Metis was higher than that of All Other Manitobans in 7 out of the 11 Regional Health Authorities (RHAs), and in 10 out of the 12 Winnipeg Community Areas (CAs). In addition, the prevalence of anxiety disorders in Metis was higher than All Other Manitobans provincially, in 8 out of the 11 RHAs, and in 6 out of the 12 Winnipeg CAs. The purpose of this report is to build on the baseline surveillance information from the Metis Atlas to support the need of Region Knowledge Networks for more detailed information.

The Research Team

The principal investigators (PI) on this study were **Dr. Julianne Sanguins** and **Dr. Judith G. Bartlett**. **Dr. Julianne Sanguins** is an Assistant Professor in the Department of Community Health Sciences in the Faculty of Medicine at the University of Manitoba, working on-site at the MMF-HWD. She is also the Research Program Manager of the MMF-HWD. **Dr. Bartlett** is an Associate Professor in the Department of Community Health Sciences in the Faculty of Medicine at the University of Manitoba, and an Adjunct Scientist with the Manitoba Centre for Health Policy (MCHP). Dr. Bartlett holds an MD, CCFP, and an MSc in Community Health Sciences. **Sheila Carter** is Director of the MMF-HWD. **Punam Mehta** is the Chronic Disease Surveillance Program Coordinator in the MMF-HWD. **Nathan Hoepfner** is a Research Associate with the Department of Community Health Sciences in the Faculty of Medicine at the University of Manitoba. **Mena Bassily** is a Research Assistant with the MMF-HWD. Through a contractual arrangement, the MCHP generated the aggregate data and provided mentorship for the MMF-HWD research team in our effort to successfully complete this research.

The Manitoba Metis Federation

The Manitoba Metis Federation (MMF), founded in 1967, is the “democratic and self-governing body of the Manitoba Metis community” (www.mmf.mb.ca). The MMF strives to develop and maintain its capacity to act collectively to successfully promote, protect, and advance the political, social, and economic interests of Metis in Manitoba. The MMF negotiates with provincial and federal governments the access to funds for a wide range of programs and services. Within the MMF, the MMF-HWD was established in 2005. By using a Metis culture-based holistic health framework, the MMF-HWD builds Metis health planning capacity, develops and implements a Metis health research agenda, and acts as a Metis health expert authority to advise the health system.

Overview of Sections

Section 1 introduces the report and briefly reviews methods used for data generation in this study.

Section 2 offers insight on the Metis, the Manitoba Metis Federation, and the Health & Wellness Department. It demonstrates the Manitoba Metis Federation–Health & Wellness

Department's (MMF-HWD) conceptual model, its holistic approach to knowledge development, and approach to ways of knowing.

In Section 3, the age and sex characteristics of the population are identified. Metis have a higher proportion of youth (aged 10-19 years) and young adults (aged 20-39 years) than All Other Manitobans, however they have a lower proportion of mid-aged adults (40-59 years) and older adults (70 years and older). For those with depression and/or anxiety disorders Metis have a higher proportion of youth (aged 10-19 years) and a lower proportion of older adults (aged 70 years and older) compared to All Other Manitobans. Throughout most of their lives, Metis males have a lower proportion of depression and/or anxiety disorders compared to Metis females; except at the age of 10-14 years when the prevalence was similar in both of Metis males and Metis females. Finally, premature mortality (PMR) – those dying before the age of 75 – was calculated for each of the groups. In this study, there was no difference in PMR between Metis and All Other Manitobans with depression and/or anxiety disorders.

Section 4 describes the prevalence of depression and/or anxiety disorders as well as the rate of the associated comorbidities. It was found that Metis have a higher prevalence of depression, anxiety disorders, depression and/or anxiety disorders, and substance abuse compared to All Other Manitobans in Manitoba. Logistic regression models revealed that Metis ethnicity constitutes an independent risk factor for depression and/or anxiety disorders and substance abuse. This is consistent with findings from the 'Metis Atlas' and other reports previously produced by the Manitoba Metis Federation-Health and Wellness Department such as the *Diabetes and Related Health Care Utilization in the Manitoba Metis Population* report and the *Ischemic Heart Disease (IHD) and Related Health Care Utilization in the Metis in Manitoba* report.

Section 5 describes health services use of Metis and All Other Manitobans with depression and/or anxiety disorders in Manitoba. Metis and All Other Manitobans have no difference in the ambulatory visit rate due to all causes, the ambulatory visit rate due to depression and/or anxiety disorders, and the psychiatrist visit rate due to depression and/or anxiety disorders. One factor for this may be a lack of access of Metis with depression and/or anxiety disorders to health care services. Finally, Metis have a higher hospital separation rate for depression and/or anxiety disorders compared to All Other Manitobans.

A Summary of the Key Findings from Regression Modeling

There are three logistic regression models presented in this study. The first logistic regression examined the possible risk factors of depression and/or anxiety disorders and found a higher risk in Metis compared to All Other Manitobans. The second logistic regression model examined the possible risk factors of substance abuse and showed a higher risk in Metis compared to All Other Manitobans. The third logistic regression model examined the possible risk factors of suicide attempts or completions and revealed that there is no difference between Metis and All Other Manitobans in the rate of suicide attempts or completed suicides.

Conclusion

Depression and/or anxiety disorders, along with other associated complications, are health issues of concern for the Metis in Manitoba. Higher rates of depression, anxiety disorders,

depression and/or anxiety disorders, and substance abuse in Metis are documented in this report. Given the young Metis population shown in Section 3 it can be anticipated that absolute numbers of Metis with depression and/or anxiety disorders may increase in the future. By working with our Metis Regions and Regional Health Authorities in a holistic manner we can promote wellness, prevent the development of disease, and assure that services and programs are delivered to ensure a healthy Metis population.

Report available online at:

<http://health.mmf.mb.ca>

Section 1: Introduction & Methods

1.1 Background of this Report

Until recently little was known about depression and anxiety disorders in Metis¹ in Manitoba. In order to support program and policy responses, health information related to depression and anxiety disorders in Metis in Manitoba is essential. This report provides an initial examination of these important health conditions.

The ability to produce Metis-specific aggregate data resulted from the building of an anonymized Metis population cohort through research collaboration between Manitoba Metis Federation (MMF) and the Manitoba Centre for Health Policy (MCHP) at the University of Manitoba. The MMF-MCHP research team produced the Profile of Metis Health Status and Healthcare Utilization in Manitoba: A Population-Based Study (Martens, Bartlett, et al., 2010) - hereafter referred to as the 'Metis Atlas'. The Metis Atlas was the first comprehensive mapping out of Metis health status in Manitoba. It is an up-to-date report of administrative data for Metis living in the province in 2006.

In the Metis Atlas, age- and sex-adjusted Metis rates for a number of chronic diseases, including depression and anxiety disorders, were measured and compared to rates for All Other Manitobans² by various geographical areas: by province, by the 11 Regional Health Authorities (RHAs), the 7 MMF Regions, and the 12 Winnipeg Community Areas (CA)s. For some data, small numbers required reporting by larger geographical areas. The Metis Atlas was a benchmark document for Metis both in Manitoba and nationally. Historically there has been no other whole population study available on the health of Metis, and very limited Metis-specific research has been conducted in Manitoba.

While Metis-specific information related to depression and anxiety disorders is very limited, there are significant indications that rates of these disorders in the Metis population tend to be higher than for the rest of the population. In the 2005 Canadian Community Health Survey (CCHS), Métis aged 12 years and older were more likely than non-Aboriginals to report experiencing a mood disorder (8.4% vs. 5.6%) or anxiety (6.6% vs. 4.3%) (Statistics Canada, 2005). The Metis Atlas reported that while the prevalence of depression in Metis and All Other Manitobans was similar provincially (22.0% vs. 20.4%), rates were higher for Metis in 7 of the 11 RHAs and in 10 of the 12 Winnipeg Community Areas (CAs). In addition, prevalence of anxiety disorders was higher for Metis compared to All Other Manitobans provincially (9.4% vs. 8.0%), in 8 of the 11 RHAs, and in 6 of the 12 Winnipeg CAs.

¹ The Manitoba Metis Federation does not use the term 'Metis' with the accent ('Métis') as is done in some parts of Canada. In this report, 'Métis' is used only when referring to sources that use the accented form.

² As noted in the Metis Atlas (Martens, Bartlett, et al., 2010): "The reader should be aware that for northern regions in particular, 'All Other Manitobans' as a comparative group would be comprised of a large portion of First Nations, which is in contrast to the southern regions where First Nations would only comprise a small portion of the population. Therefore, the composition of the comparative group may differ substantially from north to south. Given that the overall health status of First Nations is worse than the Manitoba average, the health status of the comparative group of All Other Manitobans in the north is poor, so the Metis group may show similar or better health status regionally. In contrast, the overall health status of all other Manitobans in the south is generally good, so the Metis group may show poorer health status regionally" (p. XXXII).

The Metis Atlas also pointed to a pattern of increased burden of disease, disability, and comorbidity in Metis in Manitoba that required more focused investigation. Depression and anxiety disorders are strongly associated not only with each other, but also with substance abuse, suicide attempts and completions, physician visits, hospitalizations, and pharmaceutical use – all of which are explored in this study.

The existence of the anonymized Metis population cohort (housed in the MCHP under the authority of the MMF) allows for the production of more focused studies. In this study we examine rates of depression and/or anxiety disorders and related health and social conditions in Metis compared to All Other Manitobans. The outcomes of this report will inform decision-making regarding health service delivery in our province. ‘Depression and Anxiety in Metis in Manitoba’ emerged as a direct result of the need to provide a more comprehensive measure and understanding of these conditions as they related to Manitoba Metis.

1.1.1 *Definition of Depression and/or Anxiety Disorders*

In our study, the diagnoses of depression and anxiety disorders are based on administrative data that includes records of diagnosis and treatment in the universal health care system for individuals living in Manitoba. A description of how each disorder was measured for this report is included in Section 4: Morbidity. Broadly, depression can be defined as a persistent status of sad mood that limits the functional ability of an individual (Friedman, 2011). Two common types of depression are major depressive disorder and dysthymic disorder with symptoms that range from mild to severe (Friedman, 2011). Anxiety disorders are defined as having self-controlled feelings of discomfort or dread (Vanin, 2008). There are many types of anxiety disorders such as panic disorder, obsessive-compulsive disorder, acute stress disorder, and generalized anxiety disorder. An individual can also develop an anxiety disorder due to a medical condition or it could be substance-induced (Vanin et al., 2008).

The population of interest for this study is ‘Metis with depression and/or anxiety disorders and All Other Manitobans with depression and/or anxiety disorders’. In order to avoid cumbersome repetition of this phrase in the text, this report will use ‘Metis and All Other Manitobans with depression and/or anxiety disorders’ whenever appropriate. It is important to keep in mind, however, that this refers only to individuals diagnosed with the clinical disorders in the health system. This limitation and others are discussed in more detail in sub-section 1.11.

1.1.2 *Acronyms*

In this report several acronyms are used. In an attempt to minimize confusion the most commonly used are outlined below.

APS	Aboriginal Peoples Survey
AOR	Adjusted odds ratio
CA	Community Areas
CCHS	Canadian Community Health Survey
CMI	Cumulative Mental Illness (disorders)
Depr/anx	Depression and/or anxiety disorders
ICD-9-CM	International Classification of Diseases and Related Health Problems (9th revision) Clinical Modification

ICD-10-CA	International Classification of Diseases and Related Health Problems (10th revision) Canada
MCHP	Manitoba Centre for Health Policy
MDD	Major depressive disorder
MDE	Major depressive episode
MLPF©	Metis Life Promotion Framework©
MMF	Manitoba Metis Federation
MMF-HWD	Manitoba Metis Federation-Health & Wellness Department
MPDB	Metis Population Database
NCS	National Comorbidity Survey
NCS-R	National Comorbidity Survey Replication
NPHS	National Population Health Survey
PMR	Premature mortality rate
RHA	Regional Health Authority
SES	Socioeconomic status

1.2 Background of the Research Team

The MMF-HWD research team was responsible for all aspects of this study with the exception of producing aggregate data. Specifically, the MMF-HWD selected each of the indicators examined in this study, prepared and analyzed the graphs, and wrote the text of the report.

The co-principal investigators (PI) on this study were **Dr. Julianne Sanguins and Dr. Judith G. Bartlett**. Dr. Julianne Sanguins is an Assistant Professor in the Department of Community Health Sciences in the Faculty of Medicine at the University of Manitoba. Dr. Sanguins is an RN and holds a PhD in Nursing. Dr. Sanguins is also a Research Program Manager in the MMF-HWD and was a member of the Metis Atlas research team. Dr. Sanguins managed all aspects of the academic needs of the study, including directly supervising research staff. Dr. Judith G. Bartlett is an Associate Professor in the Department of Community Health Sciences in the Faculty of Medicine at the University of Manitoba, and an Adjunct Scientist with the MCHP. Dr. Bartlett holds an MD, CCFP, and an MSc in Community Health Sciences. Dr. Bartlett was Co-Principal Investigator on the Metis Atlas as well as being PI on several projects funded by the Canadian Institutes of Health Research. She is a part time clinician and an academic physician and scientific director with a strong understanding of and experience in public health administration.

Sheila Carter is the Director of the MMF-HWD. Ms. Carter was a member of the Metis Atlas research team, providing expertise regarding health program and policy development. In this project, Ms. Carter was a community collaborator on this study and participated in the data interpretation, review, and editing of this report.

Nathan Hoepfner is a Research Associate with the Department of Community Health Sciences in the Faculty of Medicine at the University of Manitoba. He was responsible for study design, literature review and report writing. Nathan was part of the *Diabetes and related health care utilization study in the Manitoba Metis population* – our first independent chronic disease surveillance study.

Punam Mehta is the Chronic Disease Surveillance Coordinator in the MMF-HWD. Ms. Mehta holds the MSc in Community Health Sciences from the University of Manitoba and

was responsible for statistical data analysis, literature review, and report writing. Punam was part of the *Diabetes and related health care utilization in the Manitoba Metis Population* study – our first independent chronic disease surveillance study.

Mena Bassily is a Research Assistant with the MMF-HWD. Mr. Bassily holds a Masters degree in Public Health and Epidemiology from Menoufiya University, Egypt with a pre-doctoral training in exposure, risk, and epidemiology at the Harvard School of Public Health, Boston, U.S.A. Mr. Bassily assisted in data review, interpretation of data, review and editing of this report.

We continue to respect and appreciate the role of the MCHIP in our research projects. For consistency in working with the health sector, our report is structured similar to the Metis Atlas. The MCHIP generated the aggregate data and provided mentorship for the MMF-HWD research team in order to successfully complete this study. **Dr. Patricia Martens** provided mentorship to the MMF Director, **Charles Burchill** provided database support, and **Hui Chen** provided aggregated data as a statistical programmer.

1.3 Purpose of this Report and Outline of the Sections

The overall purpose of this report is to examine population-based indicators of health status and health care utilization for Metis with depression and/or anxiety disorders in Manitoba, and to answer the following questions about the burden of depression and/or anxiety disorders, associated comorbidities, and related health services utilization. For each indicator, the difference between *Metis with depression and/or anxiety disorders* and *All Other Manitobans with depression and/or anxiety disorders* were tested at three levels:

- The provincial level
- Within each of the 11 RHAs of Manitoba
- Within each of the three ‘aggregated’ non-urban areas of Rural South, Mid and North

A list of the sections included in this report is as follows:

Section 1:	Introduction and Methods
Section 2:	Overview of the MMF-Health & Wellness Department
Section 3:	Demographics and Premature Mortality
Section 4:	Morbidity Profile
Section 5:	Health Services Use
	Glossary

1.4 What is in the Report? Types of Graphs, Tables, and Analyses

Section 1 introduces the report. Section 2 offers an overview of the Manitoba Metis Federation-Health & Wellness Department (MMF-HWD). Sections 3 through 5 have consistent formatting of information and contain one or more tables, population pyramids, and/or bar graphs. There are two types of bar graphs used in this report:

- A comparison of Metis and All Other Manitobans with depression and/or anxiety disorders living in the same RHA
- A comparison of Metis and All Other Manitobans depression and/or anxiety disorders living in the same Winnipeg CA (within Winnipeg RHA)

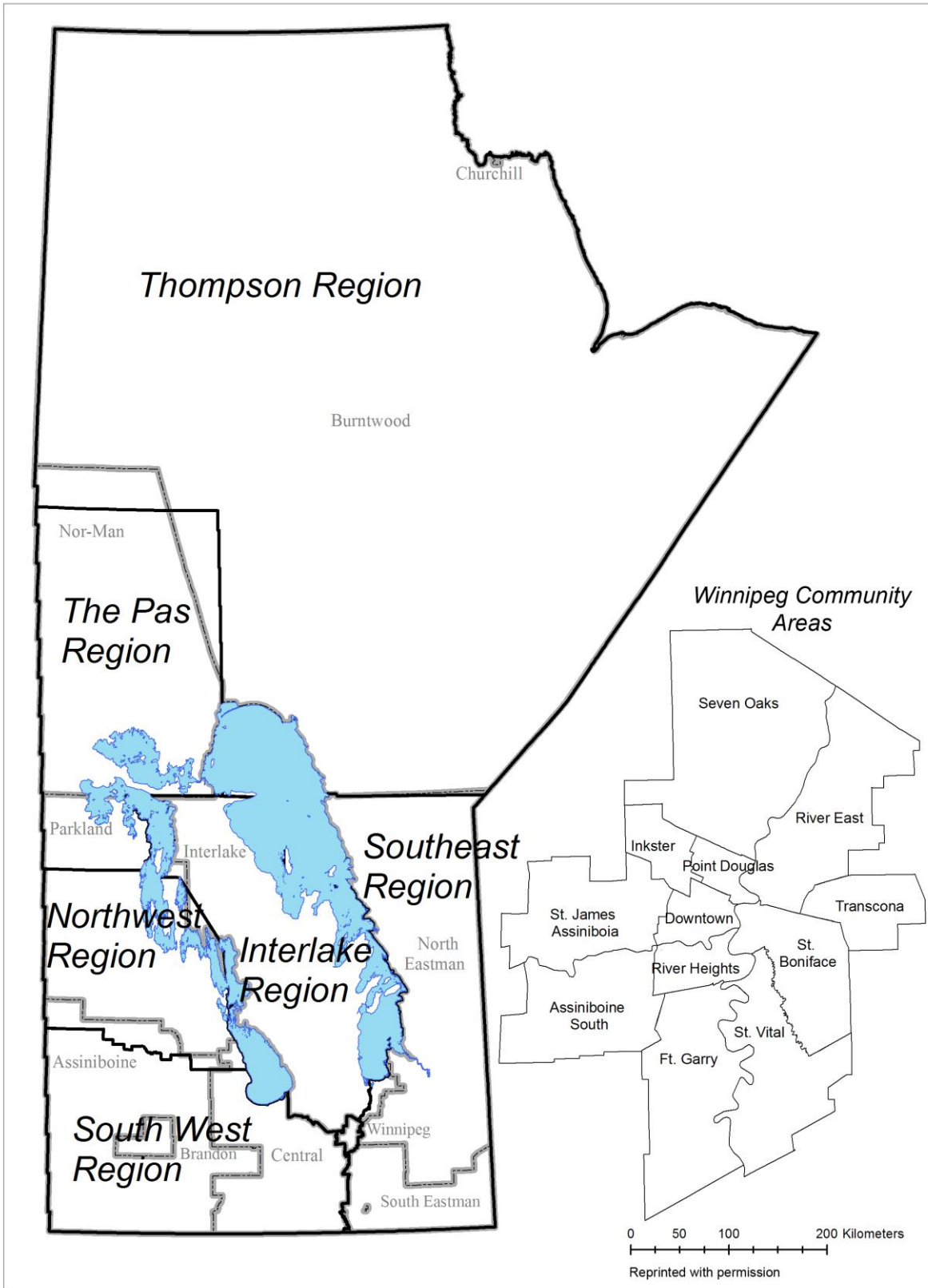
At the beginning of each section there is an ‘Overall Key Findings’ sub-section which summarizes the findings for Metis with depression and/or anxiety disorders in table format. A more detailed description of the section graphs follows the graphs. At the end of each indicator, there are findings from the literature review that compare findings from our study with relevant published information, with the results of this study in *italics*. However, for many of the indicators in our study there is little or no comparable research on the health status of Metis people in Manitoba. This report will add to the growing body of Metis-specific health information.

1.5 How to Read this Report

1.5.1 Geographical Boundaries

In this report, health information for Metis and All Other Manitobans with depression and/or anxiety disorders is compared within the context of different geographical areas. These include Manitoba’s RHAs and sub-regions within the Winnipeg Regional Health Authority (WRHA) called Winnipeg Community Areas (CAs). Figure 1.5.1 shows the geographical distribution of the MMF Regions, RHAs, and Winnipeg CAs.

Figure 1.5.1: Geographical Distribution of the MMF Regions, RHAs, and Winnipeg CAs



Source: Martens, Bartlett, et al., 2010

Regional Health Authorities and Winnipeg CAs:

In Manitoba there are 11 RHAs: Churchill, Burntwood, Nor-Man,¹ Parkland, Interlake, North Eastman, Assiniboine, Brandon, Central, South Eastman, and Winnipeg.

The WRHA encompasses the provincial capital city of Winnipeg and has a population of close to 700,000 people, or approximately 60% of Manitoba's population. (The other ten RHAs have much smaller populations, ranging from under 1,000 in Churchill RHA to over 100,000 in Central RHA.) The large population in Winnipeg RHA has been divided into 12 Winnipeg CAs: Assiniboine South, Fort Garry, St. Vital, St. Boniface, River Heights, St. James – Assiniboia, Inkster, Downtown, Point Douglas, Transcona, River East, and Seven Oaks.

Aggregate Areas in the RHA graphs:

The non-urban RHAs have been grouped into three aggregate areas: 'North', 'Mid', and 'Rural South'. North aggregate area is made up of Burntwood, Churchill, and Nor-Man RHAs; Mid aggregate area includes Interlake, North Eastman, and Parkland RHAs; and Rural South aggregate area is made up of Assiniboine, Central, and South Eastman RHAs. Grouping information in this manner provides health planners with an opportunity to compare rural and remote areas.

At times, sample sizes are too small to compare the 12 Winnipeg CAs. In these instances the Winnipeg CAs are grouped into three Winnipeg sub-regions: 'Winnipeg Most Healthy', 'Winnipeg Average Health', and 'Winnipeg Least Healthy'. 'Winnipeg Most Healthy' consists of grouped 'neighborhood clusters' with a premature mortality rate (PMR) lower than the Winnipeg average PMR: Assiniboine South, Fort Garry North, Fort Garry South, Inkster West, River East North, River East East, River East West, River Heights West, St. Boniface East, St. James – Assiniboia West, and St. Vital South. 'Winnipeg Average Health' is comprised of grouped neighborhood clusters with a PMR similar to the average PMR in Winnipeg: River Heights East, Seven Oaks North, Seven Oaks East, Seven Oaks West, St. Vital North, and Transcona. 'Winnipeg Least Healthy' is a group of neighborhood clusters with a PMR higher than the average PMR in Winnipeg: Downtown East, Downtown West, Inkster East, Point Douglas North, Point Douglas South, River East South, St. Boniface West, and St. James – Assiniboia East.

Throughout this report, the RHAs and Winnipeg CAs in the graphs are ordered by ten-year PMR, with PMR increasing from the healthiest areas at the top of the graph to the least healthy areas at the bottom of the graph. This format reflects the order used in the Metis Atlas and many MCHP publications. PMR is highly correlated with self-rated health and underlying disease burden; it is used as a general indicator of the health status of a group of people and their need for health care (Martens, Bartlett, et al., 2010). By ordering the graphs by PMR the relationship between poorer health outcomes (which increase from top to bottom of the graph) and increased usage of health services within specific populations in a specific geographical location can be seen more clearly. See Section 3 for a more thorough explanation of PMR and relevant data for Metis and All Other Manitobans with depression and/or anxiety disorders. The Glossary provides a more detailed definition of the PMR gradient (slope) from the healthiest to the least healthy areas.

¹ The correct written form of NOR-MAN RHA has capital letters throughout. However, as in the Metis Atlas, for purposes of this report NOR-MAN is indicated by Nor-Man in order to standardize naming of RHAs.

1.5.2 Making Sense of the Graphs

In this report each indicator includes a definition based upon MCHP standard definitions and a description of the population numerator and denominator included in the analysis. In addition, an abbreviated description of the population measured is also included in the subtitle for each graph.

Below the indicator definition is a description of findings related to each of the geographical boundaries in the following order (only for age- and sex-adjusted graphs and income quintile graphs):

Differences between the two groups: Metis with depr/anx and All Other Manitobans with depr/anx

- 1) Differences between the first group and the first group's provincial average: Metis with depr/anx and the provincial average for Metis with depr/anx
- 2) Differences between the second group and the second group's provincial average: All Other Manitobans with depr/anx and the provincial average for All Other Manitobans with depr/anx

With the exception of prevalence of depression, prevalence of anxiety disorders, and prevalence of depression and/or anxiety disorders, all comparisons are made between *Metis with depr/anx* and *All Other Manitobans with depr/anx*.

In this study, indicators used are measured as crude percentages, prevalence rates, and odds ratios based on standardized definitions used by the MCHP (Bartlett et al., 2010; Martens, Bartlett et al., 2010). Statistical significance is expressed in the form of p-value. A p-value of less than 0.05 for Metis and All Other Manitobans; a p-value less than 0.01 for Metis compared to their provincial average, and a p-value of less than 0.01 for All Other Manitobans compared to their provincial average. Throughout this report, unless otherwise indicated, any mention of 'lower' or 'higher' refers to results that are statistically significant. Finally, comparative groups can be Metis vs. All Other Manitobans, or Metis vs. their provincial average, or All Other Manitobans vs. their provincial average.

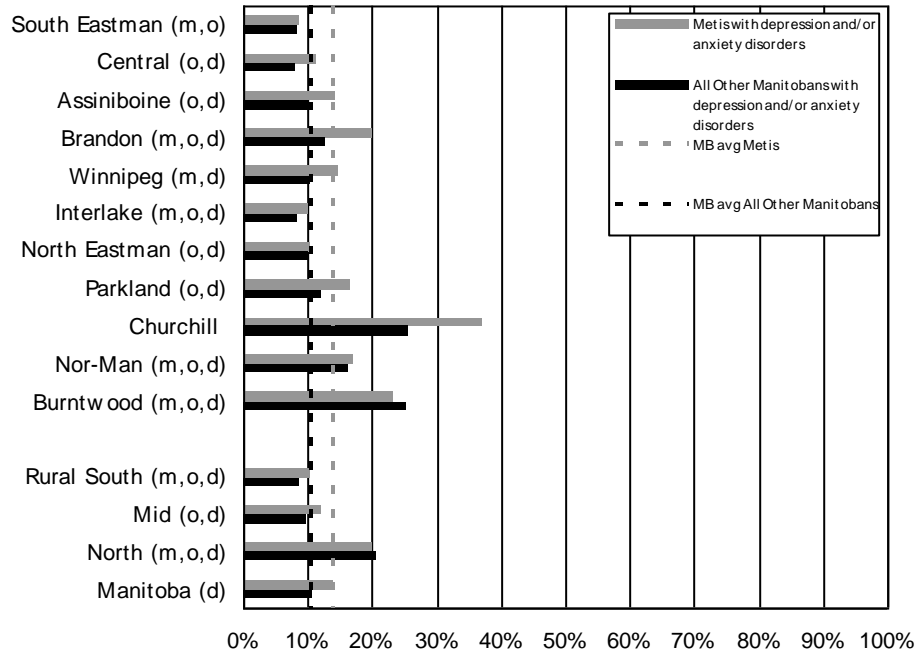
When reading this study, some general information on reading the graphs is important to understand these graphs. All indicators are measured starting at age 10 years and older, because depression and anxiety and related co-morbidities begin at a younger age compared to other chronic diseases which develop over time. In this report, there are three types of graphs: (1) age- and sex-adjusted bar graphs, (2) age- and sex-specific line graphs, (3) age- and sex- adjusted income quintile bar graphs. Each of these will be described

Below is a sample of an age- and sex-adjusted graph from our report (Figure 4.4.1).

Age- and sex-adjusted:

Figure 4.4.1: Prevalence of Substance Abuse by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

The title shows the indicator measured (substance abuse prevalence), the geographical areas shown (RHAs), the population measured (Metis and All Other Manitobans with depression and/or anxiety disorders), and the time period of measurement (fiscal year 2002/03-2006/07). The subtitle (in smaller font) describes the population measured (residents aged 10+) and indicates if the data are age- and sex-adjusted or based on crude numbers (in Figure 4.4.1 they are age- and sex-adjusted). The insert box in the top-right corner of the graph is the legend, which provides a breakdown of what the bar and dotted lines on the graph represent. The light grey horizontal bar represents the indicator rate for Metis with depression and/or anxiety disorders whereas the dark grey bar represents the indicator rate for All Other Manitobans with depression and/or anxiety disorders. The light grey vertical dotted line represents the Manitoba provincial average for Metis with depression and/or anxiety disorders whereas the black vertical dotted line represents the provincial average for All Other Manitobans with depression and/or anxiety disorders.

The letters 'm', 'o', 'd', and 's' represent a classification developed by the MCHP and used extensively in other Atlases. As the key at the bottom of each chart notes:

- 'm' indicates the area rate for Metis with depression and/or anxiety disorders was statistically different from the provincial average for Metis with depression and/or anxiety disorders
- 'o' indicates the area rate for All Other Manitobans with depression and/or anxiety disorders was statistically different from the provincial average for All Other Manitobans with depression and/or anxiety disorders

- ‘d’ indicates the area rate for Metis with depression and/or anxiety disorders was statistically different from the area rate for All Other Manitobans with depression and/or anxiety disorders
- ‘s’ indicates the data were suppressed due to small numbers

For example, in the chart above South Eastman RHA has the notation (m, o) beside it on the y-axis (left side) of the graph. According to the classification system the ‘m’ means that Metis with depression and/or anxiety disorders in South Eastman RHA are statistically different compared to the provincial average for Metis with depression and/or anxiety disorders. As the line for Metis with depression and/or anxiety disorders is shorter than the provincial average line for Metis with depression and/or anxiety disorders, we can conclude that Metis with depression and/or anxiety disorders have a lower prevalence of substance abuse compared to their provincial average. The ‘o’ denotes that All Other Manitobans with depression and/or anxiety disorders in this geographical area are statistically different from the Manitoba average for All Other Manitobans with depression and/or anxiety disorders. As the line for All Other Manitobans is shorter than their provincial average line we can conclude that All Other Manitobans with depression and/or anxiety disorders in South Eastman RHA have a lower prevalence of substance abuse compared to their provincial average. There is no ‘d’, which means that there is no statistical difference between prevalence of substance abuse in Metis with depression and/or anxiety disorders in South Eastman RHA and that of All Other Manitobans with depression and/or anxiety disorders.

Age- and sex-specific:

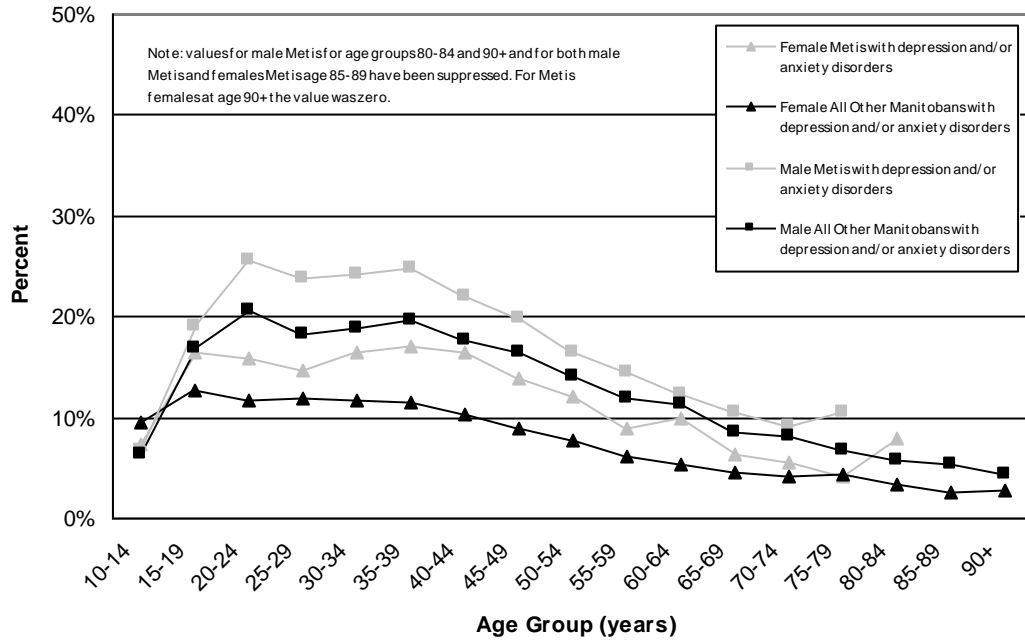
Figure 4.4.3 is an example of an age- and sex-specific graph used in this report. These line graphs show crude rates of an indicator. The insert text box in the top-right corner of the graph is the legend, which provides a breakdown of what the lines on the graph represent. Each line on the graph represents one of the four following population groups:

- 1) Metis females
- 2) All Other Manitoban females
- 3) Metis males
- 4) All Other Manitoban males

When you are reading the age- and sex-specific graph, the age group (years) distributions are presented on the x-axis (horizontal line) as follows: 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, and 90+ years and older. The indicator measurement is presented on the y-axis (vertical line) as the crude rate of residents aged 10+ in a five-year period.

Figure 4.4.3: Substance Abuse in Manitoba by Age and Sex for Metis with Depression and/or Anxiety Disorders and All Other Manitobans with Depression and/or Anxiety Disorders, 2004/05-2006/07

Crude percent of residents aged 10+ years



To ensure consistency in the interpretation of age- and sex-specific data the key observations follow a logical order:

- 1) Overall trends for Metis males and Metis females (*e.g. Throughout most of their lives, Metis males and Metis females have a decreasing crude prevalence of substance abuse. The highest rates are seen in the young adult and mid-aged population.*)
- 2) Metis males compared to All Other Manitobans males and Metis females compared to All Other Manitoban females (*e.g. Throughout most of their lives Metis males and Metis females have a higher crude prevalence of substance abuse compared to All Other Manitoban males and All Other Manitoban females, respectively.*)
- 3) Metis males compared to Metis females (sometimes we compare All Other Manitoban males to All Other Manitoban females, if these comparisons are meaningful) (*e.g. Throughout their lives, Metis males have a higher crude prevalence of substance abuse compared to Metis females.*)
- 4) Other important findings/trends that are unique to a specific indicator and provide useful information for health planning and/or policy

Figure 4.4.3 shows that Metis males and Metis females have an increasing crude prevalence of substance abuse until the age of 35-39 years when crude prevalence decreases. However, there is a slight increase at the age of 75-79 years for Metis males and the ages of 60-64 years and 80-84 years for Metis females. Next, you will note that throughout most of their lives, Metis males and females have a higher crude prevalence of substance abuse compared to All Other Manitoban males and females, respectively. Finally, throughout their lives Metis males have a higher crude prevalence of substance abuse compared to Metis females.

Income Quintiles:

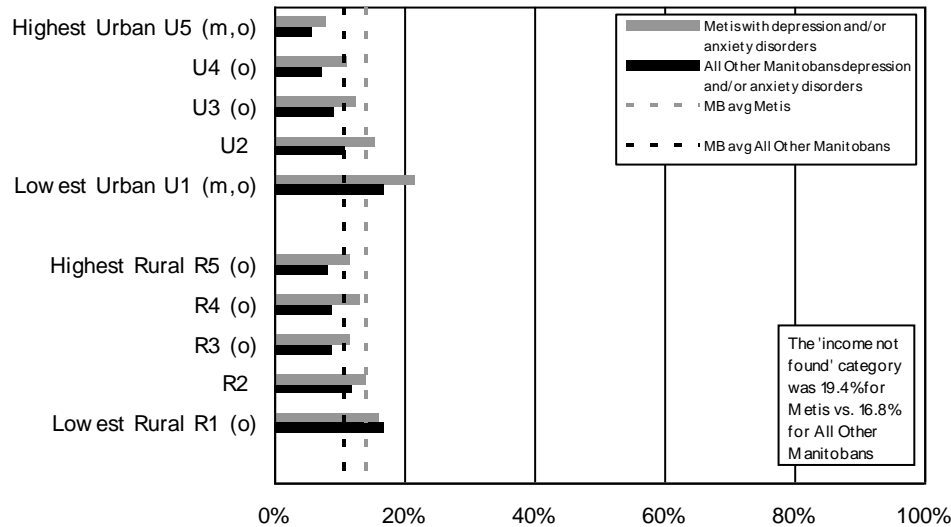
Income quintiles are based on the average (mean) household income of census dissemination areas (Fransoo et al., 2005). These dissemination areas, which are small geographical areas of up to 400-700 people in one or more neighborhood blocks, were created by Statistics Canada using census data (Martens, Bartlett, et al., 2010; Statistics Canada, 2011). Postal Code Conversion Files (PCCF) were linked with these Statistics Canada census dissemination areas in order to assign neighborhood level area income quintiles (Martens, Brownell, et al., 2010). All area-income quintile (level) were divided geographically as either urban (Winnipeg or Brandon) or rural (all other areas of Manitoba) with each area-income quintile (level) falling into one of five categories each representing 20% of the total population (Fransoo et al., 2005). In addition, every person within this average household income grouping is *assumed* to have the same average household income (Fransoo et al., 2005). The five urban and five rural area level neighborhood income quintile categories are ordered from the ‘highest’ to the ‘lowest’ neighborhood incomes arranged as follows: U5 (urban 5), U4, U3, U2, and U1 (urban 1) or R5 (rural 5), R4, R3, R2, and R1 (rural 1). However, not everyone falls into these income quintiles. There is a proportion of the population that falls into an ‘income not found’ category which includes individuals who could not be assigned an income quintile because they lived in a dissemination area not included in Statistics Canada census data (Martens, Bartlett, et al., 2010; Manitoba Centre for Health Policy [MCHP], 2006a). Dissemination areas do not include individuals who are residents of long-term care facilities, residents of some personal care homes, residents of psychiatric facilities, federal and long-term prisons, wards of Public Trustee and Child and Family Services, residents of various areas not reporting an income, and those with no permanent address (Martens, Bartlett et al., 2010).

The light grey horizontal bar represents the indicator rate for Metis whereas the dark grey bar represents the rate for All Other Manitobans. The light grey vertical dotted line represents the Manitoba provincial average for Metis whereas the black vertical dotted line represents the provincial average for All Other Manitobans. Interpretation of income quintile graphs is similar to the age- and sex-adjusted graphs as it uses the same classification system of ‘m’, ‘o’, ‘d’, ‘s’.

Directly below the graph are the results of a linear trend test to determine the presence of an increasing or decreasing trend by income quintile (MCHP, 2006b). Linear trend tests were done to determine an association between indicator values (e.g. substance abuse prevalence) and area-level income data (e.g. R1 [rural 1] – lowest income quintile) (Fransoo et al., 2005). A p-value of < 0.01 indicates a trend is present for the specified group (Metis or All Other Manitobans) and rural or urban income quintiles (Fransoo et al., 2005). In this study, income quintiles are compared to see if there is an increasing or decreasing linear trend. A linear trend on an income quintile graph can increase or decrease depending on the sign (+/-) in front of the test result number. An increasing trend identified with a positive sign that means that as neighborhood income quintile decreases the rate of disease also decreases. A negative sign means that as neighborhood income quintile decreases the rate of disease increases.

Figure 4.4.4: Prevalence of Substance Abuse by Income Quintile in Manitoba for Metis with Depression and/or Anxiety Disorders and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
'd' indicates the difference between the two groups' rates was statistically significant for this area
's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results
Urban Metis: Significant (p < 0.001) Urban All Other Manitobans: Significant (p < 0.001)
Rural Metis: Significant (p < 0.001) Rural All Other Manitobans: Significant (p < 0.001)

Figure 4.4.4 is an income quintile graph used in this report. The title shows the indicator measured (substance abuse prevalence by income quintile), the geographical areas shown (either urban or rural), the population measured (Metis and All Other Manitobans), and the time period of measurement (fiscal years: 2002/03-2006/07). The subtitle (in smaller font) describes the population measured (residents aged 10+ years with substance abuse) and indicates that the data is presented as a percentage of residents. The insert box in the top-right corner of the graph is the legend, which provides a breakdown of what the bar and dotted lines on the graph represent. The x-axis (horizontal line) shows the percentage of the population with substance abuse respective of income group. The y-axis shows the different income quintiles within the two groups in urban (Winnipeg and Brandon) and rural (all other areas of Manitoba) regions. The 'income not found' group includes people whose income was not identified.

As shown in Figure 4.4.4, there is no difference between both urban and rural Metis and urban and rural All Other Manitobans, respectively. Yet, Metis have a higher prevalence of substance abuse compared to their provincial average in urban U1 (21.7% vs. 14.3%) and a lower prevalence in U5 (7.9% vs. 14.3%). All Other Manitobans have a lower prevalence of substance abuse compared to their provincial average in U5 (6.0% vs. 10.7%), U4 (7.5% vs. 10.7%), and U3 (9.1% vs. 10.7%), whereas they have a higher prevalence than their provincial average in U1 (17.0% vs. 10.7%). Among the five rural income quintiles, All Other Manitobans have a higher prevalence of substance abuse compared to their provincial average in R1 (17.0% vs. 10.7%) whereas they have a lower prevalence of substance abuse compared to their provincial average in R5 (8.4% vs. 10.7%), R4 (8.9% vs. 10.7%), and R3 (9.0% vs. 10.7%).

The text-box in the lower right hand corner of the graph shows the ‘income not found’ category. Metis whose income was not identified have a prevalence of substance abuse of 19.4% in comparison to 16.8% in All Other Manitobans ‘income not found’ group. There is an increasing linear trend for substance abuse among urban Metis, rural Metis, urban All Other Manitobans, and rural All Other Manitobans from the highest (richest) to the lowest (poorest) income quintiles. This means that substance abuse prevalence increases as the income quintile decreases in both urban and rural areas.

Unless otherwise indicated any mention of ‘lower’ or ‘higher’ in this report refers to results that are statistically significant. Statistical significance is a term commonly used throughout this report. It means that we are 95% certain that the difference between the two comparison groups is due to a real difference and not due to random variation in the populations (Wassertheil-Smoller, 1995).

1.6 Methods Used in This Report

Population-based health research is the cornerstone of public health research. It provides information related to patterns of health and illness in a population, and is used to inform evidence-based decision making around disease treatment and service delivery (Gordis, 1996).

Our report is a population-based research study. As Martens, Bartlett, et al. (2010) note, this means several things:

- 1) Data is based on every person living in Manitoba who had a provincial health card during the time period measured, and includes all people living in Manitoba’s First Nations communities.
- 2) Information is based on where individuals live and not where they go for treatment. This provides greater accuracy when comparing the health issues and health care utilization of people living in particular geographic regions.
- 3) Rates are not based upon smaller ‘samples’, but rather the entire population fitting specific criteria – hence ‘population-based’.

It is important to note that for some indicators the data are based on a small number of individuals. For most indicators where numbers resulted in suppression (five individuals or less), the aggregate data were produced by aggregate areas (e.g., Winnipeg, Brandon, Rural South, Mid, and North). In some cases, suppression could not be avoided due to the relative rareness of the condition or event.

1.7 Datasets Used in This Research

The data sources used in chronic disease surveillance and research are often limited to existing secondary data sources such as administrative data, which is data that are collected for a purpose other than research (e.g., physician billing records). The MCHP stores sets of data collectively referred to as the Population Health Research Data Repository (the Repository). The data stored in the Repository is used for research related to health and social services in Manitoba. It houses a wealth of information useful to community organizations, community planners, governments, and researchers (Martens, Bartlett, et al., 2010). However, it is important to understand that each dataset has an owner; hence approvals must be sought from each dataset owner in order to link one dataset to another.

To protect the confidentiality of citizens, all names, street addresses, and Personal Health Information Numbers (PHINs) were removed from the data required for this study, and new encrypted identification numbers assigned to each individual (Martens, Bartlett, et al., 2010). These anonymized data were retrieved from the following files in the Repository located at the MCHP:

- Hospital claims (records of hospital admissions)
- Medical claims (records of visits to physicians excluding those for a hospital inpatient)
- Physician files to identify the type of service provided (e.g., a family physician/general practitioner or a specialist such as a psychiatrist)
- The registry files (records of the time a person is registered as a resident of Manitoba, as well as their age, sex, and area of residence)
- Vital statistics (records of births, deaths, and causes of death)
- Pharmaceutical claims (pharmaceutical use from the Drug Program Information Network)
- The 2006 Census files (for socioeconomic information at the neighborhood level) – used in logistic regression

Depending on the data source, prevalence and incidence rates were generated for particular fiscal years or calendar years (Martens, Bartlett, et al., 2010). Many of the variables used in this study are based on fiscal year (e.g., antidepressant use was measured for 2006/07, which represents the fiscal year from April 1, 2006 to March 31, 2007) because most health care utilization information is reported by fiscal year; other variables such as PMR are based on calendar years (e.g., 2002-2006). Specific periods of measurement for each indicator (e.g., five-year time period for PMR) were chosen by the MCHP to ensure adequate sample sizes, which facilitate proper modelling of statistical data. Indicators in this report present more than one year of data. The graphs are generally presented using an annualized rate which is the average value for a single year of cumulative data. Exceptions are indicated in the graph subtitle when they do occur.

1.8 How was the Cohort Created?

The Metis Population Database (MPDB) was used to develop the cohort for the Metis Atlas and the subsequent studies. The MPDB is an anonymized dataset including health information for a total of more than 73,000 Metis of all ages in Manitoba (Martens, Bartlett, et al., 2010). The MPDB includes Manitoba Metis identified from three sources: the MMF membership list, the Canadian Community Health Survey (CCHS), and the National Population Health Survey (NPHS) in addition to the children, siblings, and both parents of these individuals (Martens, Bartlett, et al., 2010). When developing the cohort for this study, however, the segment of the population identified through the CCHS and NPHS (including children and parents matched to these individuals) were not included. It was determined that exclusion of this relatively small group in the Metis cohort for our study would have no significant effect on our analysis; they were included instead in the All Other Manitobans cohort.

1.9 Data Production and Analysis

Statistical modelling and aggregate data production were performed by the staff of statisticians at the MCHP. A more detailed explanation of data production and analysis can be found in the Metis Atlas.

1.9.1 *Generation of Rates*

Rates were generated through a statistical technique called a generalized linear model (GLM). GLM emerged as a way of unifying various statistical tests. In our study the MCHP used Poisson and negative binominal distribution models to count data and logistic regression to predict the influence of one variable (the dependent or explanatory variable) on a condition or event while controlling for other variables (the independent variables). MCHP determined what model to use based upon the statistical model which best fit the data.

For age- and sex-adjusted rates, both age and sex were included in a model to adjust for differences in underlying regional age and sex distributions. Adjusted rates were based on relative risks of rates rather than events for each region for both Metis and All Other Manitobans (Martens, Bartlett, et al., 2010).

To determine differences by region and by Metis versus All Other Manitobans, covariates described geography (using Manitoba as the reference population) and ethnicity, as well as geography by ethnicity interactions (Martens, Bartlett, et al., 2010).

1.9.2 *Crude and Adjusted Rates*

In this study, each indicator is presented as either crude or an adjusted rate. Age- and sex-adjusted rates have been statistically adjusted in order to compare different populations. The adjusted rates for different populations represent what the populations' rates would be if the populations all had the same age and sex distribution (Gordis, 1996). This is particularly important when comparing Metis and All Other Manitobans with depression and/or anxiety disorders. We know from Section 3 that Metis with depression and/or anxiety disorders have a higher proportion of young people and a lower proportion of older people compared to All Other Manitobans with depression and/or anxiety disorders (see Figure 3.1.1 and Figure 3.1.2). In addition, it was known that mental health problems are more prevalent among females (Beck et al., 2005). The adjustment of data for age and sex accounts for this difference, allowing for true comparability between Metis and All Other Manitobans with depression and/or anxiety disorders.

Indicators in this study also include age- and sex-specific information based on crude rates. Crude (i.e., not adjusted) rates are determined by simply dividing the total count of a condition or event by the total population. Crude rates are shown by sex and age groups in order to see exactly which sub-groups in the population have the greatest burden of disease (Gordis, 1996). They are helpful in figuring out how many people are 'walking through the door' for treatment and for determining trends in disease distribution between different populations. Age- and sex-specific charts are included in response to requests for more in-depth information from our Knowledge Networks and because of their policy implications for future health services planning and provision.

1.9.3 *Prevalence and Incidence Rates*

The terms ‘prevalence’ and ‘incidence’ are both used in this report. Prevalence refers to the total number of cases of certain disease or event in a certain population in a specified time and place. If the prevalence of depression is 10.0% this tells us that one in ten people have been diagnosed with depression over the period of measurement. Prevalence is an important indicator because it measures the extent of spread of certain disease in a community, which can be helpful for health planning.

In this report, incidence refers to the number of new cases or incidents in a population over a specific time period. For some indicators an individual can contribute more than once to the incidence rate. For example, one person could have more than one hospitalization contributing to the overall rate of hospitalizations in a given period of time.

1.9.4 *Logistic Regression Modeling*

Logistic regression is a statistical tool that allows us to understand the many factors which contribute to a condition, including age, sex, geography, annual income, or comorbidities. For specific indicators, the use of logistic regression enables us to determine the unique contribution of a single factor while controlling for the other factors including age and sex differences. It is important to remember that logistic regression does not indicate causation, but only factors associated with a specific outcome (Martens, Bartlett, et al., 2010). In this study depression and/or anxiety disorders, substance abuse, and suicide completions or attempts were explored using logistic regression.

As explained in the Metis Atlas (Martens, Bartlett, et al., 2010), the adjusted Odds Ratio (aOR) indicates a higher or lower likelihood of a specific outcome after taking into account the other factors. If this number is bolded in our logistic regression tables, this means that the likelihood of occurrence of the disease is statistically significant. Statistical significance is also indicated by a ‘p-value’ less than 0.05 and a ‘95% Confidence Interval’ that does not include 1. An aOR of greater than 1 together with a p-value less than 0.05 and 95% Confidence intervals both above 1 indicate a significantly higher likelihood; an aOR of less than 1 together with a p-value of less than 0.05 and 95% Confidence Limits both below 1 indicate a significantly lower likelihood.

In the logistic regression table (Table 4.3.1) you can see that for the ‘Metis’ factor the aOR is 1.272. The p-value is less than 0.05 and the 95% Confidence Interval does not include 1, which means that the aOR is statistically significant. Therefore in this study, Metis have a higher risk to develop depression and/or anxiety disorders compared to All Other Manitobans after adjusting for other factors in the table. It is important to emphasize that in the logistic regression tables only the first factor (Metis vs. All Other Manitobans) compared Metis and All Other Manitobans separately. All the other factors applied to all Manitobans (Metis and All Other Manitobans combined).

Table 4.3.1: Logistic Regression Modeling for the Possible Predictors of Depression and/or Anxiety Disorders Diagnosis, 2002/03-2006/07

Probability of Depression and/or Anxiety Disorders by Aggregate Region for Residents Aged 10+ years

Covariates	Adjusted Odds Ratio (95% Confidence Interval)	p-value
Metis (vs. All Other Manitobans)	1.271 (1.245-1.297)	<0.001
Aggregate Regions (ref=Manitoba)		
South	0.920 (0.909-0.931)	<0.001
Mid	0.965 (0.952-0.977)	<0.001
North	0.710 (0.696-0.724)	<0.001
Brandon	1.303 (1.278 – 1.319)	<0.001
Winnipeg	1.218 (1.207 – 1.229)	<0.001
Substance Abuse	3.510 (3.439 – 3.581)	<0.001
Schizophrenia	4.473 (4.245 – 4.713)	<0.001
Personality Disorders	17.414 (16.335 – 18.565)	<0.001
Age, linear	1.063 (1.062 – 1.064)	<0.001
Age, quadratic	0.999 (0.999 – 0.999)	<0.001
Males (vs. Females)	0.447 (0.443 – 0.452)	<0.001
Average Household Income of Neighborhood (per \$10,000)	0.982 (0.979 – 0.984)	<0.001
Major Physical Illness ADGs	1.590 (1.571 – 1.608)	<0.001

Bold = statistically significant results

Note: Please see Glossary for definition of all variables.

Source: MMF, 2011

Information in the logistic regression models in this report may provide valuable insights into factors at both the individual and regional level that may influence the likelihood of a specific outcome. After controlling for variations in individual characteristics, those regions of the province that still have a greater likelihood of a bad outcome (or lesser likelihood of a good outcome) could be examined for particularly effective programs or policies. Conversely, those regions that demonstrate a greater likelihood of a good outcome could be further explored to contribute to our understanding. Once again, it is important to remember that a regression model does not indicate causation. However, it may highlight factors to be considered by health planners and policy makers.

1.10 Data Interpretation

Within the MMF there was a systematic collaborative process used for review of every graph for each indicator used in our study. The review process involved three steps: reviewing for scientific integrity (data processing), ensuring the context of the data was captured, and describing each graph in point form.

1.11 Limitations

There are several limitations to this study which are important for readers to keep in mind. The information in this report is based on analyses of administrative data which are claims data from the universal health care system in Manitoba. With the minor exception of possibly incomplete ‘shadow billing’ (see sub-section 5.1), administrative data are very effective indicators of health services utilization in this province; however, these data may be less effective indicators of the prevalence of chronic disease, and particularly of mental health conditions (Lix et al., 2006). Manitobans who might have met clinical criteria for one or more of the morbidity indicators in this report (depression, anxiety disorders, and substance abuse) during the time period of interest but were not hospitalized or did not see a physician for the condition were not recorded in the administrative claims data and as a result they have not been included in this study. This is a significant limitation, as a recent study using results from the 2002 CCHS indicate that only 41% of individuals (47% of women and 32% of men) with depression and/or anxiety disorders in Ontario sought mental health care in the year prior to the survey (Kakuma, 2007). Also not included in the administrative data used in this study are mental health services recorded only in the Mental Health Management Information System (MHMIS). However, it was anticipated that the omission of MHMIS data, which includes case management information for Manitoba residents using specific mental health services, would not significantly affect disease prevalence or the measures of health services use in this study (MCHP, 2010a). These issues are crucial to remember when comparing the findings from this study with those in the literature, as many studies of depression, anxiety disorders, substance abuse, and suicidal behaviours rely largely on self-reported survey data. It is important to note that prevalence rates displayed in this study may be an underestimation of mental health rates since people have to seek treatment to be captured by the data.

In this study, prevalence of depression included individuals treated for depressive mood disorders, such as major depression, dysthymia, bipolar disorders secondary to a primary diagnosis with major depressive disorder, as well as those who had at least one visit to a physician for which they were prescribed antidepressants or mood stabilizers. Anxiety disorders were measured for individuals treated for various anxiety disorders, including panic disorder, generalized anxiety disorder, phobias, and obsessive-compulsive disorder. These criteria were used in an attempt to address difficulties with diagnosing and coding depression, anxiety disorders, and related conditions (MCHP, 2010b). It is very likely that criteria for these conditions in other studies will differ from those used in this report; for this reason, it is again important to use caution when making comparisons between this report and findings from other studies.

This study shares the general limitations related to measuring and comparing rates of suicide completions or attempts common in other studies. For example, suicide-like accidents and other hazardous behaviours are not always counted, though they appear to be associated

with depression and co-morbid depression/anxiety (Mykletun et al., 2007). Any suicide attempts can be even more challenging to measure and compare. Methods of determining what qualifies as a suicide attempt vary, and suicide attempts are not always reported or counted, particularly in administrative data (Langlois & Morrison, 2002; Martens et al., 2004; Nock & Kessler, 2006; Thorpe et al., 2001).

The indicator 'hospital separations due to depression and/or anxiety disorders' does not include separations from the two mental health centres in Manitoba: Eden Mental Health Centre in Winkler (Central RHA) and Selkirk Mental Health Centre in Selkirk (Interlake RHA). Since the early 1980s, the vast majority of hospital separations for mental illness in Canada have been from general or acute care hospitals (Government of Canada, 2006). Martens et al. (2004) demonstrated that this is also true in Manitoba: For both males and females with depression or anxiety disorders between 1997/98 and 2001/02, age-adjusted hospital separation rates for mental illnesses in Manitoba were 15-30 times higher for acute care facilities than for mental health centres. It is probably a safe assumption that the data from acute care hospitals in this province include the vast majority of separations for depression and/or anxiety disorders in Manitoba.

There is a distinct possibility that antidepressant use counted in this study may not have been only to treat depression or anxiety. Off-label use of antidepressants is defined as the use of these medications for purposes, patients, or in doses not approved by regulatory bodies. This is a very common clinical practice, with as many as 75% of individuals in the general population using antidepressants have received at least one prescription for 'off-label' use (Beck et al., 2005; Chen et al., 2006; de Paulsen, 2005). Moreover, some antidepressants have been approved for treatment of conditions other than depression or anxiety disorders, including smoking cessation, pain syndromes, and bulimia nervosa (Beck et al., 2005; Chen et al., 2006). However, for the present study it is postulated that the use of antidepressants for conditions other than depression or anxiety disorders would likely be quite small, as this indicator is measured only for individuals with depression and/or anxiety disorders specifically.

In addition, the rate of drug prescription (antidepressant prescription rate) is based on the rate of filled prescriptions of each drug, not the actual drug use rate. A limitation of this indicator is that we assumed that each patient who was prescribed a drug for treatment of depression and/or anxiety disorders uses the drug as prescribed by his/her physician.

Finally, Premature Mortality Rate (PMR) was calculated based on life expectancy of 75 years for Canadians. However life expectancy is a dynamic figure that changes over time on annual basis and may differ according to the sex and ethnic subgroup of individuals within the same population. In most instances, the life expectancy for females is longer than in males by 3 - 5 years in average, so calculating PMR at age 75 for both sexes is considered a limitation.

1.12 Summary

Until recently, the health and social concerns of Metis have been largely invisible. Metis concerns have often been absent from health program and policy planning – in no small part due to the lack of data on the health of Metis in Manitoba. This study provides a reliable source of information of the burden of disease for Metis with depression and/or anxiety disorders in this province. Health planners, policy makers, and Metis community members can work collaboratively, in the light of the facts in this report, to change the picture of Metis health in Manitoba.

References

- Bartlett, J.G., Sanguins, J., Carter, S., Hoepfner, N., & Mehta, P. (2010). *Diabetes and related health care utilization in the Manitoba Metis population*. Winnipeg, MB: Manitoba Metis Federation.
- Beck, C. A., Patten, S. B., Williams, J. V. A., Wang, J. L., Currie, S. R., Maxwell, C. J., & El-Guebaly, N. (2005). Antidepressant utilization in Canada. *Social Psychiatry and Psychiatric Epidemiology*, 40(10), 799-807.
- Chen, H., Reeves, J. H., Fincham, J. E., Kennedy, W. K., Dorfman, J. H., & Martin, B. C. (2006). Off-label use of antidepressant, anticonvulsant, and antipsychotic medications among Georgia Medicaid enrollees in 2001. *Journal of Clinical Psychiatry*, 67(6), 972-982.
- De Paulsen, N. (2005). The regulatory gap: Off-label drug use in Canada. *University of Toronto Faculty of Law Review*, 63(2), 183-211.
- Fransoo, R., Martens, P.J., The Need to Know Team (funded through CIHR), Burland, E., Prior, H., Burchill, C., ... & Wallad, R. (2005). *Sex differences in health status, health care use and quality of care: A population-based analysis for Manitoba's Regional Health Authorities*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Friedman, S.E. (2011). Chapter 1: Classes, causes, and epidemiology. In S.E. Friedman & M.I. Anderson, M.I. (Eds.), *Handbook of depression* (pp.1-10). London: Springer Health Care.
- Gordis, L. (1996). *Epidemiology*. Toronto, ON: W.B. Saunders Company.
- Government of Canada. (2006). *The human face of mental health and mental illness in Canada, 2006*. Ottawa, ON: Minister of Public Works and Government Services Canada.
- Kakuma, R. (2007). *Utilization of health services for depression and anxiety in Ontario: An eleven-year comparison of determinants*. (Doctoral dissertation). Retrieved from http://digitool.library.mcgill.ca/webclient/StreamGate?folder_id=0&dvs=1306255480551~879
- Langlois, S., & Morrison, P. (2002). Suicide deaths and attempts. *Health Reports*, 13(2), 9-22.
- Lix, L., Yogendran, M., Burchill, C., Metge, C., McKeen, N., Moore, D., & Bond, R. (2006). *Defining and validating chronic diseases: An administrative data approach*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Manitoba Centre for Health Policy. (2006a). *Term definition: Income not found*. Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?printer=Y&definitionID=102883>
- Manitoba Centre for Health Policy. (2006b). *Glossary definition: Linear trend test*. Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?printer=Y&definitionID=102973>
- Manitoba Centre for Health Policy. (2010a). *Mental Health Management Information System (MHMIS)* (glossary definition). Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=103096>

- Manitoba Centre for Health Policy. (2010b). *Depression – defining in administrative data* (concept description). Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewConcept.php?printer=Y&conceptID=1180>
- Martens, P.J., Bartlett, J., Burland, E., Prior, H., Burchill, C., Huq, S., Romphf, L., Sanguins, J., Carter, S., & Bailly, A. (2010). *Profile of Metis health status and healthcare utilization in Manitoba: A population-based study*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Martens, P.J., Brownell, M., Au, W., MacWilliam, L., Prior, H., Schultz, J., ...& Seronka, K. (2010). *Health inequities in Manitoba: Is the socioeconomic gap widening or narrowing over time?* Winnipeg, MB: Manitoba Centre for Health Policy.
- Martens, P., Fransoo, R., McKeen, N., The Need to Know Team, Burland, E., Jebemani, L., ...& Metge, C. (2004). *Patterns of regional mental illness disorder diagnoses and service use in Manitoba: A population-based study*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Mykletun, A., Bjerkeset, O., Dewey, M., Prince, M., Overland, S., & Stewart, R. (2007). Anxiety, depression, and cause-specific mortality: The HUNT study. *Psychosomatic Medicine*, 69(4), 323-331.
- Nock, M. K., & Kessler, R. C. (2006). Prevalence of and risk factors for suicide attempts versus suicide gestures: Analysis of the National Comorbidity Survey. *Journal of Abnormal Psychology*, 115(3), 616-623.
- Patten, S. B., Wang, J. L., Beck, C. A., & Maxwell, C. J. (2005). Measurement issues related to the evaluation and monitoring of major depression prevalence in Canada. *Chronic Diseases in Canada*, 26(4), 100-106.
- Statistics Canada (2005). *Canadian Community Health Survey 2005*. Retrieved from <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3226&lang=en&db=imdb&adm=8&dis=2>
- Statistics Canada. (2011). *Geographic units: Dissemination area (DA)*. Retrieved from <http://www12.statcan.ca/english/census01/Products/Reference/dict/geo021.htm>
- Thorpe, L., Whitney, D. K., Kutcher, S. P., Kennedy, S. H., & the CANMAT Depression Work Group. (2001). Clinical guidelines for the treatment of depressive disorders: VI. Special populations. *Canadian Journal of Psychiatry*, 46(Suppl. 1), 63S-76S.
- Vanin, J.R. (2008). Chapter 1: Overview of anxiety and anxiety disorders. In J.R. Vanin & J.P. Helsing (Eds.), *Anxiety Disorders: A Pocket Guide for Primary Care* (pp.1-18). Totowa, New Jersey: Humana Press.

Section 2: Overview of the MMF-Health & Wellness Department

Authors: Dr. J. G. Bartlett and Ms. S. Carter

2.1 Introduction

The Manitoba Metis Federation-Health & Wellness Department (MMF-HWD) undertakes Metis-specific health research along with a province-wide engagement process to enhance the use of this research. This section provides an overview of the Metis, the Manitoba Metis Federation (MMF), highlights of the MMF-HWD's use of a Metis-specific lens, and Knowledge Networks. A more complete discussion of the details touched upon in this section can be found in Chapter 2 of the *Metis Atlas* (Martens, Bartlett, et al., 2010).

2.2 The Metis

The Metis are descendants of early 17th-century relationships between North American Indians and Europeans (Sprague & Frye, 1983). The Metis coalesced into a distinct nation in Manitoba in the late 18th century. After the 1885 fall of Batoche, “Metis were denied a separate identity and ignored for a century” (McMillan, 1995, pp. 312–313). By 1967, with the formation of the Manitoba Metis Federation, the Metis in Manitoba were again asserting their capacity to advocate and function once more in a collective manner. In the 1982 amendment to the Canadian Constitution Metis were named as one of the three Aboriginal peoples of Canada (Government of Canada, 1982).

2.3 The Manitoba Metis Federation

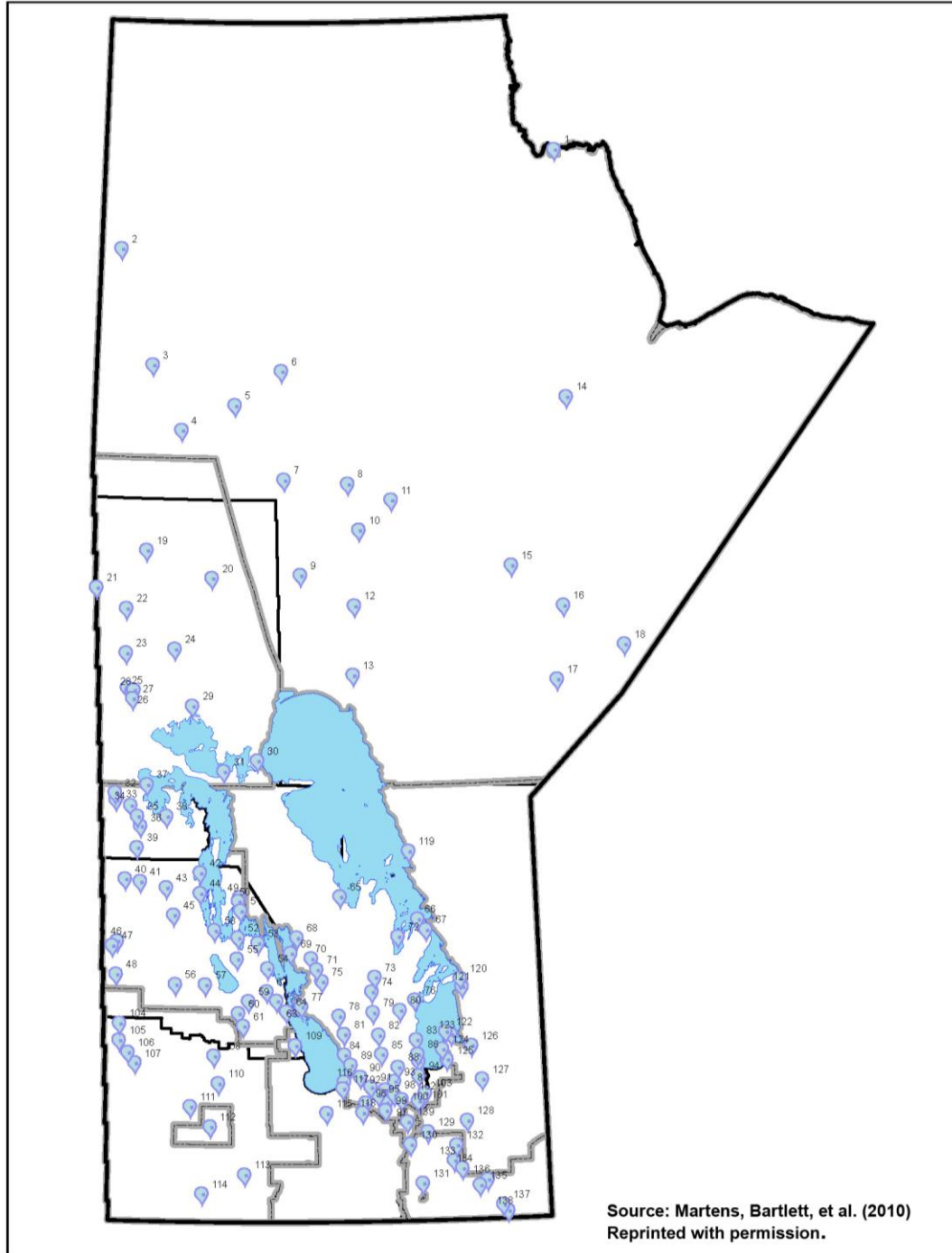
The Manitoba Metis Federation website (2010) documents that to be an Individual Member or Child Member of the Manitoba Metis Federation you must:

1. Self-identify as Metis
2. Show an ancestral connection to the Historic Metis Community
3. Be accepted by the contemporary Metis Community

For 46 years, the MMF has ‘acted collectively’ to promote, protect, and advance the political, social, and economic interests of Metis citizens in Manitoba. The MMF negotiates with governments to access funding for programs and services that are better able to meet Metis citizens’ cultural norms. Metis citizens live in 139 villages, towns, cities and unorganized territories (See Figure 2.3.1) across Manitoba.

Twenty-one Representatives and a President are elected as the MMF Governing Body every four years. The MMF has seven Regions and a Home Office, along with a number of associated subsidiaries and affiliations. The MMF Governing Body leads, manages, and guides the strategic direction, objectives, and policies of the Federation and its subsidiaries. The President is the Chief Executive Officer, leader, and MMF spokesperson. The MMF has an Executive Director responsible for overseeing the day-to-day operations of the Federation. Each Region is administered by an elected Vice President and two elected Directors.

Figure 2.3.1: Villages, Towns, Cities, and Unorganized Territories Where Metis Live in Manitoba, 2009



Note: In Figure 2.3.1 (above), the black lines represent the MMF Regions and the grey lines represent the RHAs.

Code Key for Villages, Towns, Cities, and Unorganized Territories (In Regional Order).

Thompson Region		San Clara	47	Warren	95
Churchill	1	Roblin	48	Marquette	96
Brochet	2	Mallard	49	Grosse Isle	97
Lynn Lake	3	Rock Ridge	50	Stonewall	98
Granville Lake	4	Waterhen	51	Rosser	99
Leaf Rapids	5	Spence Lake	52	Stony Mountain	100
South Indian Lake	6	Crane River	53	Lockport	101
Nelson House	7	Cayer	54	St. Andrews	102
Thompson	8	Rorketon	55	Selkirk	103
Wabowden	9	Gilbert Plains	56	Southwest Region	
Thicket Portage	10	Dauphin	57	Russell	104
Pikwitonei	11	Winnipegosis	58	Binscarth	105
Cross Lake	12	Ste. Rose	59	St. Lazare	106
Norway House	13	Laurier	60	Birtle	107
Gillam	14	McCreary	61	Erickson	108
Oxford House	15	Eddystone	62	Amaranth	109
Gods Lake Narrows	16	Bacon Ridge	63	Minnedosa	110
Garden Hill	17	Kinosota	64	Rivers	111
Red Sucker Lake	18	Interlake Region		Brandon	112
The Pas Region		Dauphin River	65	Belmont	113
Sherridon	19	Matheson Island	66	Boissevain	114
Snow Lake	20	Pine Dock	67	Portage la Prairie	115
Flin Flon	21	Fairford	68	St. Ambroise	116
Cranberry Portage	22	Steep Rock	69	St. Marks	117
Wanless	23	Grahamdale	70	St. Eustache	118
Cormorant	24	Moosehorn	71	Southeast Region	
Umpherville	25	Fisher Bay	72	Berens River	119
Big Eddy Settlement	26	Hodgson	73	Seymourville	120
Young Point	27	Fisher Branch	74	Manigotagan	121
The Pas	28	Ashern	75	Victoria Beach	122
Moose Lake	29	Riverton	76	Traverse Bay	123
Grand Rapids	30	Vogar	77	Grand Marais	124
Easterville	31	Eriksdale	78	Beaconia	125
Red Deer Lake	32	Poplarfield	79	Powerview	126
Barrows	33	Arborg	80	Lac du Bonnet	127
Baden	34	Lundar	81	Ste. Rita	128
Mafeking	35	Narcisse	82	Lorette	129
Bellsite	36	Gimli	83	St. Adolphe	130
Dawson Bay	37	Oak Point	84	St. Malo	131
Pelican Rapids	38	Inwood	85	Richer	132
Northwest Region		Winnipeg Beach	86	La Broquerie	133
Birch River	39	Matlock	87	Marchand	134
Swan River	40	Teulon	88	Woodridge	135
Minitonas	41	St. Laurent	89	St. Labre	136
Duck Bay	42	Lake Francis	90	Vassar	137
Cowan	43	Woodlands	91	South Junction	138
Camperville	44	Argyle	92	Winnipeg Region	
Pine River	45	Balmoral	93	Winnipeg	139
Boggy Creek	46	Petersfield	94		

2.4 Manitoba Metis Federation-Health & Wellness Department

The MMF-Health & Wellness Department (MMF-HWD) was created in July 2005 to become a Metis-specific ‘health knowledge authority.’ Over time it has solidified a vision of ‘a well Metis community’ with its mission of ‘creating and facilitating the use of knowledge’ to contribute to improving Metis health status. The MMF-HWD is focused on four main strategies intended to move department activity toward its vision. These include:

- Using a Metis culture-based holistic wellness framework
- Building Metis health planning capacity
- Implementing a Metis health research agenda
- Developing as a Metis ‘Health Knowledge Authority’ to advise the health system

For the MMF-HWD, the Metis Atlas was ‘the’ base research setting the stage for a range of new research and related activities intended to positively influence the health and wellbeing of Metis citizens in Manitoba. The anonymized (no names) Metis Population Database (MPDB), created during production of the Metis Atlas is housed in the Manitoba Centre for Health Policy (MCHP) under a data sharing agreement that ensures MMF Ownership, Control, Access, and Stewardship (OCAS). This maximizes privacy protection for Metis citizens. As well, the MMF has developed a stringent process for use of the MPDB in new projects, whether by its own MMF-HWD researchers or other university-situated researchers. The MPDB enabled generation of aggregated data for this ‘Depression and/or Anxiety Disorders in Metis in Manitoba’ study.

2.5 Description of a Culturally Coherent Metis ‘Methodology’ or Lens for Wellness

2.5.1 *Ways of Knowing*

The MMF-HWD approaches all departmental activities from a Metis-specific Methodology (that is, a Metis perspective or lens). This Metis lens is rooted in the integration of our historic Indigenous and European ancestries to become a uniquely Metis ‘way of knowing’. Adapted from work by Burton-Jones (1999), the MMF-HWD considers the inclusion of both ‘ways of knowing’ as appropriate for Metis. This Metis ‘way of knowing’ is holistic that includes: Narrative (our story, spiritual); Experience (our experience, emotional); Data (our research, physical); and Information (our synthesis of the first three, intellectual). This simple approach is used to demystify research (Figure 2.5.1), and to envelop our strategies (Figure 2.5.2).

Figure 2.5.1: Holistic Research Model

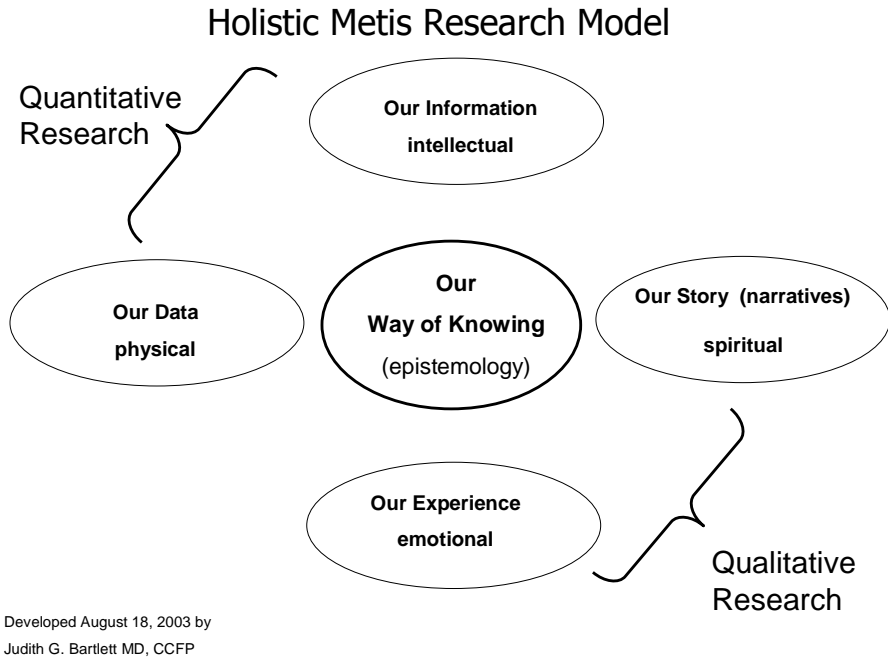


Figure 2.5.2: MMF-HWD Strategies



The MMF-HWD adapted a holistic framework originally developed for use in a community-requested holistic urban Aboriginal community health centre (Bartlett, 1995). For use with Metis, the framework was renamed the Metis Life Promotion Framework© (MLPF©). It is critical to keep in mind that the MLPF© is a tool for holistically organizing thoughts and information – it does not ‘represent’ Metis culture. The MLPF© includes finding ‘balance’ among 16 important areas that help to ‘determine how our life unfolds’ [*spiritual, emotional, physical, and intellectual; child, youth, adult, and elder (senior); individual, family, community, and nation; cultural, social, economical, and political*] (i.e. 16 Determinants of Life (Figure 2.5.3).

Figure 2.5.3: Metis Life Promotion Framework© Determinants of Life

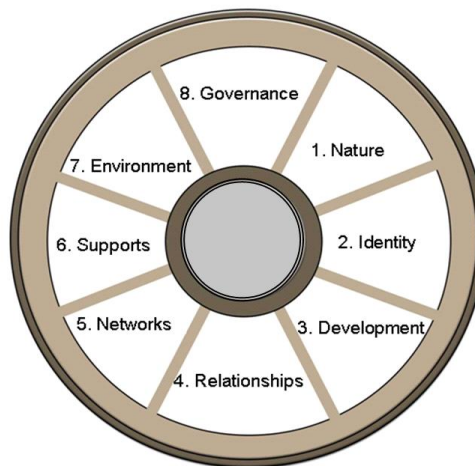
Health can be considered a balance of:



Developed by Judith G. Bartlett MD, MSc, CCFP

In 1996, the framework was adapted to consider ‘Wellness’ (Bartlett, 2004). The 16 ‘Determinants of Life’ were grouped as eight Wellness Areas©, which made it easier to think about the determinants for health planning and interpretation of research findings. MLPF© Wellness Areas© naturally flow around the spokes of a Red River cart, representing constant motion and change (Figure 2.5.4).

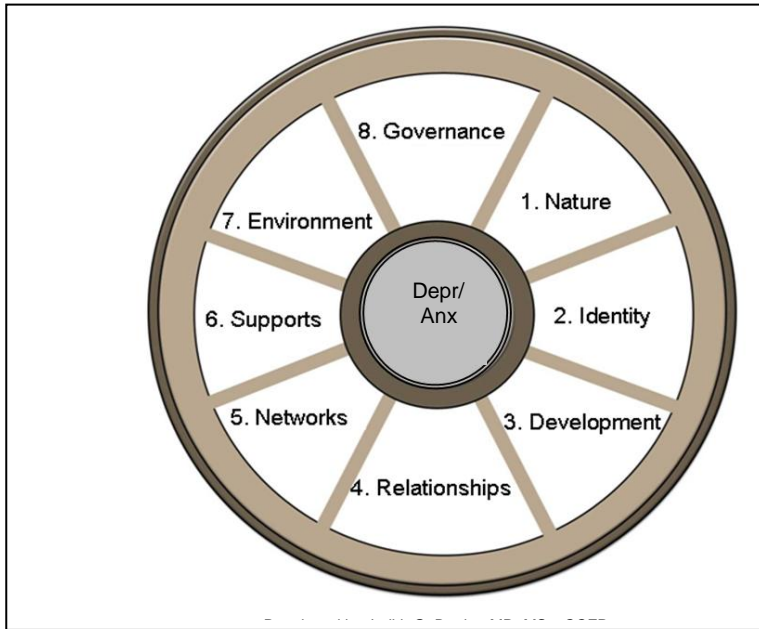
Figure 2.5.4: Wellness Areas©



Developed by Judith G. Bartlett MD, MSc, CCFP

Although not explicitly an accepted Metis lens, this tool allows every person engaged in Metis-related health planning to undertake a process where they learn ‘how to create’ Wellness Areas based on their own life experience. The Wellness Areas© can be used for individuals, families, or groups as well as distinct diseases. Figure 2.5.5 illustrates the use of Wellness Model for those with depression/anxiety. Table 2.5.1 demonstrates the types of questions individuals are asked about their own experiences.

Figure 2.5.5: Wellness Model for Examining Depression and/or Anxiety Disorders



Developed by Judith G. Bartlett MD, MSc, CCFP

- Approaching diseases from a wellness prospective
- Needs to occur at both policy & program levels

Table 2.5.1: Wellness Areas© Question Type

WELLNESS AREA©	QUESTION: How does depression and/or anxiety disorders affect my:
Nature	sense of who I really am as a person?
Identity	experience of how others see me or how I want others to see me?
Development	sense of age/ability to express the child, youth, adult, and elder parts of me?
Relationships	ability to respect and care for others?
Networks	ability to interact with others?
Supports	body, and my ability to work and be involved in my community?
Environment	cultural, social, economic, and political influence?
Governance	ability to choose my destiny and future?

2.6 Knowledge Translation

Knowledge Translation (KT) essentially means using *'what we know'* from research to influence *'what gets done'* in health/social programs/services in order to improve health (Masching, 2006). Using KT for the *Depression and/or Anxiety Disorders in Metis in Manitoba* project maximizes benefit for Manitoba Metis citizens. The MMF-HWD's existing Knowledge Network (KN) 'discussion tables' (Table 2.6.1) will examine the Metis health information in this report. For a more detailed description of this process, see Chapter 2 in the Metis Atlas (Martens, Bartlett, et al., 2010).

Table 2.6.1: Knowledge Networks – MMF Regions with RHAs

Region Knowledge Networks	
MMF Region	RHA
Thompson	Burntwood
	Churchill
Southeast	North Eastman
	South Eastman
Southwest	Brandon
	Assiniboine
	Central
The Pas	Nor-Man
Northwest	Parkland
Interlake	Interlake
Winnipeg	Winnipeg

Each Knowledge Network carefully examines the study results and documents *'what it now knows'*, which can result in practical *'changes to what is done'* in the health system and MMF program planning.

In June 2012, the RHAs underwent restructuring. The reorganization of the RHAs will result in subsequent restructuring of the Knowledge Networks. It is at this level that this study will have the most impact, in influencing health policy and programs in Manitoba to improve services for Metis in the province.

References

- Bartlett, J. G. (2004, November). Leadership environment. Paper presented at the 2004 *CMA Leaders Forum: Leaders Developing Leaders*, Ottawa, ON.
- Bartlett, J. G. (1995). Medicine Wheel Framework for Health. *Theory, reality, hope: Proceedings of the Third International Conference on Diabetes and Indigenous Peoples*. Winnipeg, MB.
- Burton-Jones, A. (1999). *Knowledge capitalism: Business, work, and learning in the new economy*. Oxford, UK: Oxford University Press.
- Government of Canada. (1982). *Constitution Act: Section 35*. Retrieved June 17, 2011 from http://laws.justice.gc.ca/eng/Const/page-12.html#anchors:7-bo-ga:l_II
- Manitoba Metis Federation. (2010). *Membership application and confirmation package*. Retrieved Sept 30, 2010 from http://mmf.mb.ca/images/pdf/membership/mmf_membership_package.pdf
- Martens, P. J., Bartlett, J., Burland, E., Prior, H., Burchill, C., Huq, S., Romphf, L., Sanguins, J., Carter, S., & Bailly, A. (2010). *Profile of Metis health status and healthcare utilization in Manitoba: A population-based study*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Masching, R. (2006). *The essentials of knowledge translation: Fact sheet*. Ottawa, ON: Canadian Aboriginal AIDS Network. Retrieved from <http://caan.ca/new/wp-content/uploads/2010/06/KT.pdf>
- McMillan, A. D. (1995). *Native peoples and cultures of Canada*. Toronto, ON: Douglas & McIntyre.
- Sprague, D. N., & Frye, R. P. (1983). *The genealogy of the first Métis nation: The development and dispersal of the Red River Settlement, 1820-1900*. Winnipeg, MB: Pemmican Publications.

Section 3: Demographics and Mortality

Population health is an approach to thinking about health differences across populations and asking why some populations are healthier than others are. By doing so, population health researchers seek to improve the health of the entire population and reduce inequalities between groups within the population (Young, 2005). This section focuses on the demographics (age and sex characteristics) of the Metis population with depression and/or anxiety disorders (depression and/or anxiety disorders) in Manitoba. Population pyramids and line graphs draw an age- and sex-specific picture of people with depression and/or anxiety disorders in this province. Premature mortality rates (PMR), which measure the number of people dying before the age of 75, are also presented. Mortality (i.e., death rate) statistics such as PMR are frequently used as overall indicators of population health (Gordis, 1996).

It is important to understand the age and sex characteristics of our population so that health programs and services for Metis in Manitoba can be adapted to best meet our unique needs. This is especially true when there may be inequalities in health status, access to health care services, and public health programs between Metis and All Other Manitobans.

The Manitoba Centre for Health Policy (MCHP) developed all indicator criteria used in this section for the Metis Atlas (Martens, Bartlett et al., 2010) unless otherwise noted. As noted in Section 1, the phrase ‘Metis and All Other Manitobans with depression and/or anxiety disorders’ refers to Metis with depression and/or anxiety disorders and All Other Manitobans with depression and/or anxiety disorders. Also, as noted in this section, unless otherwise indicated any mention of ‘lower’ or ‘higher’ refers to results that are statistically significant.

Indicators in this section include:

- Age profile of Manitoba
- Age profile of Manitobans with depression and/or anxiety disorders
- Premature mortality rate

3.1 Age Profile of Manitoba

One of the most effective ways to describe the age and sex distribution of a population is to use population pyramids, which provide important information on the health status of a population in a specific geographical location (Young, 2005). A population pyramid is a graphical depiction of a population showing males on the left side, females on the right side, the youngest age group at the bottom, and the oldest age group on the top.

As explained by Merrill and Timmreck (2006), populations across the world are affected differently by birth rates, mortality (death) rates, migration rates, and other factors, which contribute to the shape of a population pyramid. On one hand, many developing countries will have a population pyramid which is triangular, indicating a higher birth rate (i.e. faster growing population) and a lower proportion of older people (i.e. population not living to an older age). On the other hand, developed countries such as Canada will tend to have a population pyramid that looks more rectangular, which indicates a population that has a lower birth rate and higher proportion of older people. However, population pyramids may not reflect the age and sex distribution of different sub-groups within a population. For

example, the population pyramids illustrating the entire population of Manitoba do not directly reflect the unique ‘shape’ of the Metis population with depression and/or anxiety disorders in this province.

In this study, we were able to ‘pull out’ information on this subset of the Metis population using the Metis Population Database, highlighting crucial differences between the Metis and All Other Manitoban populations with depression and/or anxiety disorders. It is important to remember that, unlike in the Metis Atlas, when developing the cohort for this study the segment of the Metis population identified through the Canadian Community Health Survey and National Population Health Survey (including children and parents matched to these individuals) was not included. In addition, in this study the population pyramid only includes individuals aged 10 years and older, as this is the standard age group used to measure the prevalence of mental disorders by the Manitoba Centre for Health Policy.

The first population pyramid below (Figure 3.1.1) shows the age and sex distribution of the overall Metis and All Other Manitoban populations aged 10 years and older. This indicator displays the demographics of Metis and All Other Manitobans with *and* without depression and/or anxiety disorders combined. The second population pyramid (Figure 3.1.2) focuses specifically on Metis and All Other Manitobans with depression and/or anxiety disorders. The percentages of the population aged 10 years and older within each age category are grouped in five-year intervals, from 10-14 to 85+ years of age. Males are shown on the left side of the graph and females are shown on the right side of the graph. All of the Metis columns add up to 100%, as do all of the All Other Manitobans columns. This means that all Metis or All Other Manitobans aged 10 years and older are represented by these two groupings, respectively. The percentages in these graphs are based on 2006 data from the Population Registry located at the Manitoba Centre for Health Policy. Population totals are given immediately below the pyramid title.

Key observations:

Population Pyramid of Metis and All Other Manitobans (Figure 3.1.1)

Both sexes:

- Metis in Manitoba have a greater proportion of youth aged 10-19 years (20.9% vs. 16.2%), a higher proportion of young adults aged 20-39 years (33.1% vs. 29.8%), and a lower proportion of older adults aged 70+ (7.0% vs. 11.7%) compared to All Other Manitobans

Population Pyramid of Metis and All Other Manitobans with depression and/or anxiety disorders (Figure 3.1.2)

Both sexes:

- Metis with depression and/or anxiety disorders in Manitoba have a higher proportion of youth aged 10-19 years (5.8% vs. 4.7%), a higher proportion of young adults aged 20-39 years (37.4% vs. 31.0%), a similar proportion of mid-aged adults aged 40-59 years (39.1% vs. 40.6%), and a lower proportion of older adults aged 70 years and older (7.3% vs. 13.1%) compared to All Other Manitobans with depression and/or anxiety disorders
- Both Metis and All Other Manitobans with depression and/or anxiety disorders have a lower proportion of males than females (32.7% vs. 67.3%) and (34.9% vs. 65.1%),

respectively. This trend is consistent across all age groups except between the ages of 10-14 years when they are similar for both groups

- Throughout most of their lives, Metis males have a lower rate of depression and/or anxiety disorders compared to Metis females except between the ages of 10-14 years when they have a similar rate

Males

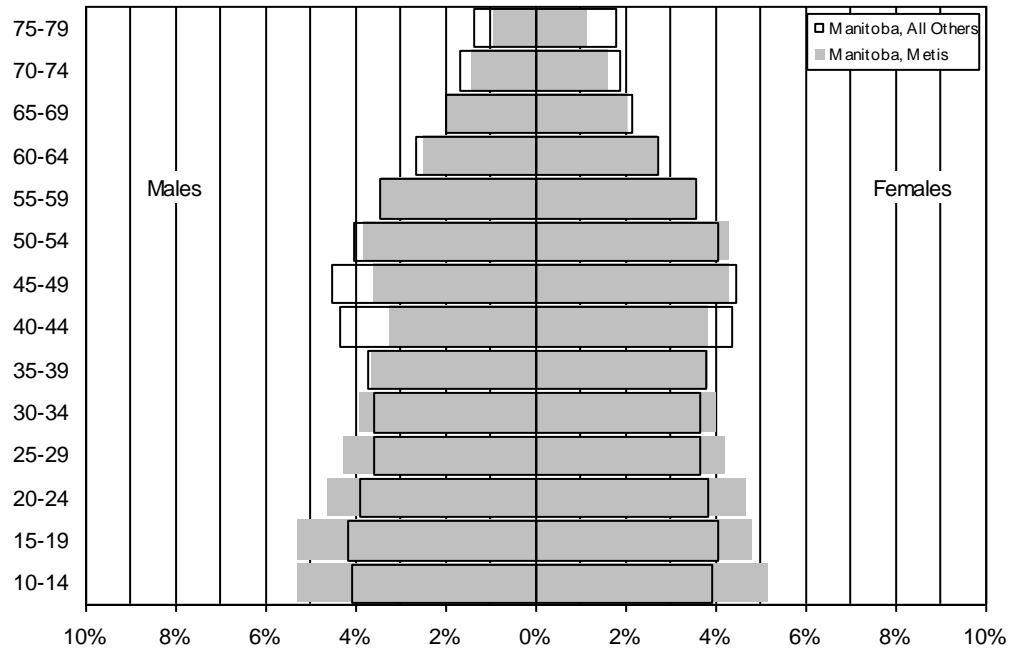
- Metis males with depression and/or anxiety disorders have a lower proportion aged 10-19 years (2.3% vs. 2.9%), a higher proportion aged 20-39 years (12.3% vs. 10.6%), a lower proportion aged 40-59 years (12.6% vs. 14.7%) and in those over the age of 60 (2.2% vs. 4.0%) compared to All Other Manitoban males with depression and/or anxiety disorders

Females

- Metis with depression and/or anxiety disorders have a higher proportion of females aged 10-19 years (3.5% vs. 2.9%), 20-39 years (25.1% vs. 20.4%), and 40-59 years (26.5% vs. 25.9%), but a lower proportion of females aged 60-85 years (5.1% vs. 9.1%) compared to All Other Manitoban females with depression and/or anxiety disorders

Figure 3.1.1: Population Pyramid of Metis and All Other Manitobans, 2006

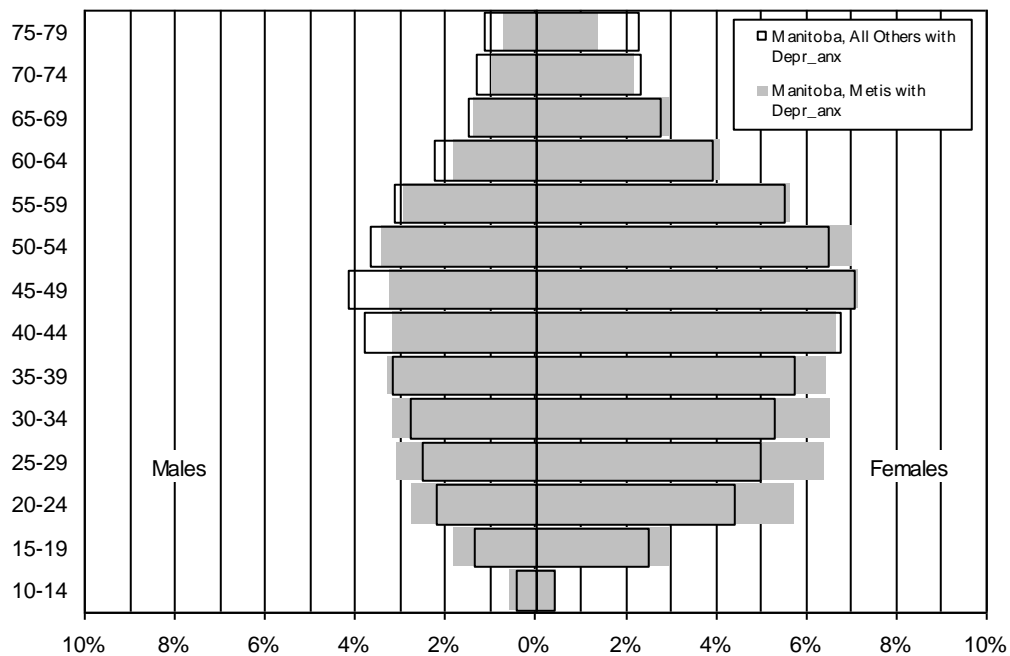
Metis Population Aged 10+ years: 60,144
 All Other Manitobans Population Aged 10+ years: 971,089



Source: MMF, 2013

Figure 3.1.2: Population Pyramid of Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2006

Male Metis Population Aged 10+ years with Depression and/or Anxiety Disorders: 4,717
 Female Metis Population Aged 10+ years with Depression and/or Anxiety Disorders: 9,730
 Male All Other Manitobans Population Aged 10+ years with Depression and/or Anxiety Disorders: 69,316. Female All Other Manitobans Population Aged 10+ years with Depression and/or Anxiety Disorders: 129,288



Source: MMF, 2013

Findings from Literature Review

(Compared to the results in this study – *in italics*)

Metis make up 33% of Aboriginal peoples in Canada, numbering 389,785 in 2006 (Janz, Seto, & Turner, 2009). They are the fastest growing Aboriginal group in Canada, with an increase in population of 91% between 1996 and 2006 (Statistics Canada, 2008). Increased rates of self-identification are partially responsible for this change in demographics. Between 1996 and 2006, the number of self-identified Metis in Manitoba increased from 40,720 to 71,805, representing an increase of 76% (Statistics Canada, 2008). In addition, the Metis population in Manitoba had a higher proportion of older people and a smaller proportion of younger people compared to All Other Manitobans in Manitoba (Martens, Bartlett et al., 2010). The information in the Metis Atlas was not specific to those living with depression and/or anxiety disorders.

There are no comparative studies of the population distribution for Metis with depression and/or anxiety disorders reported in the literature. Comparisons with general Metis population data are difficult because our study focused solely on Metis in Manitoba aged 10 years and older. In our study, Metis with depression and/or anxiety disorders have a greater proportion of youth aged 10-19 years, and young adults aged 20-39 years, in contrary to a lower proportion of older adults aged 70 years and older compared to All Other Manitobans with depression and/or anxiety disorders. This denotes that depression and/or anxiety disorders affect Metis population at younger ages than All Other Manitobans.

Upon examining Metis adults with depression and/or anxiety disorders, we observed a higher proportion of youth and young adults (19-39), and a lower proportion of individuals aged 70 years and older compared to All Other Manitobans with Depression and/or anxiety disorders. This may highlight the stresses and challenges faced by the young Metis generations.

3.2 Premature Mortality Rate

Premature mortality rate (PMR) is a measure used internationally to reflect the health status of a population. PMR is the annual age-adjusted number of deaths per 1,000 persons before the age of 75. Premature mortality rate is an overall indicator of population health, with higher rates indicating poorer health (Eyles & Birch, 1993). It is commonly used because it is simple to measure using vital statistics files. However, PMR does not reveal specific reasons why deaths at an earlier age might be high or low in a particular geographical location or for a specific population.

In our study, PMR is presented as both an age- and sex-adjusted, and a sex-specific, annual rate of death per 1,000 residents aged 10 to 74 with depression and/or anxiety disorders for calendar years 2002-2006. The denominator includes all Manitoba residents with depression and/or anxiety disorders aged 10 to 74 years as of December 31 of each year (2002 to 2006). In this indicator, Metis with depression and/or anxiety disorders are compared to All Other Manitobans with depression and/or anxiety disorders.

Key observations:

Metis and All Other Manitobans with depression and/or anxiety disorders

Manitoba (Figure 3.2.1):

- There is no difference in PMR between Metis and All Other Manitobans in Manitoba (4.6 vs. 4.3 per 1,000)

Aggregate areas (Figure 3.2.1):

- There is no difference in PMR between Metis and All Other Manitobans at the aggregate level
- There is a PMR gradient for Metis and All Other Manitobans from the most healthy to the least healthy aggregate areas

RHAs (Figure 3.2.1):

- There is no difference in PMR between Metis and All Other Manitobans in Manitoba at the RHA level
- All Other Manitobans have a higher PMR compared to their provincial average in Burntwood RHA (6.2 vs. 4.3 per 1,000)
- There is no PMR gradient for Metis and All Other Manitobans from the most healthy to the least healthy RHAs

Winnipeg CAs (Figure 3.2.2):

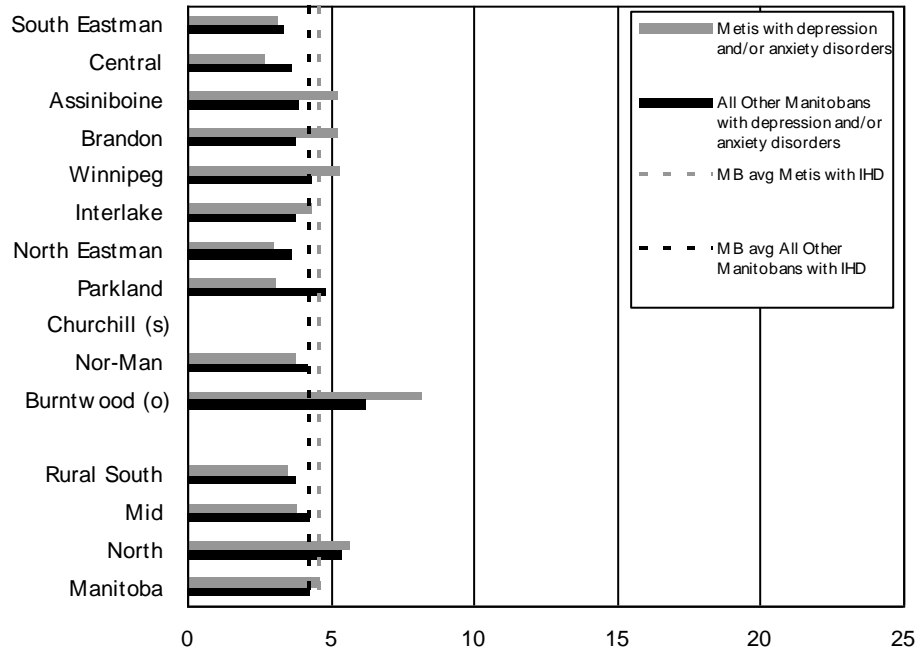
- There is no difference in PMR between Metis and All Other Manitobans at the CA level
- Metis have a higher PMR compared to their provincial average in Point Douglas CA (8.2 vs. 4.6 per 1,000)
- All Other Manitobans have a higher PMR compared to their provincial average in Downtown (6.6 vs. 4.3 per 1,000) and Point Douglas (6.8 vs. 4.3) CAs whereas they

have a lower PMR compared to their provincial average in Fort Garry (3.3 vs. 4.3), St. Vital (3.1 vs. 4.3), and River East (3.4 vs. 4.3) CAs

- There is no PMR gradient for Metis and All Other Manitobans from the most healthy to the least healthy CAs

Figure 3.2.1: Premature Mortality Rate by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002-2006

Age- and sex-adjusted rate per 1,000 residents aged 10+ years

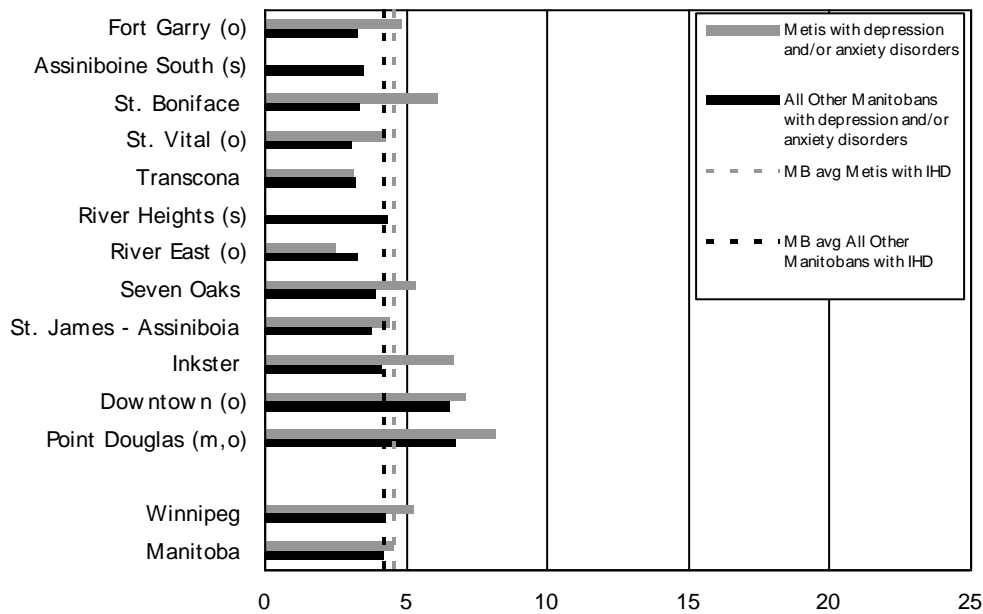


'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
'd' indicates the difference between the two groups' rates was statistically significant for this area
's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 3.2.2: Premature Mortality Rate by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002-2006

Age- and sex-adjusted rate per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
'd' indicates the difference between the two groups' rates was statistically significant for this area
's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Age- and Sex-Specific:

Manitoba (Table 3.2.1):

- Metis females have a higher sex-specific PMR compared to All Other Manitoban females (4.8 vs. 3.9 per 1,000)
- Metis females with depression and/or anxiety disorders have a higher sex-specific PMR compared to All Other Manitoban females with depression and/or anxiety disorders (3.9 vs. 3.1 per 1,000)

Table 3.2.1: Premature Mortality Rate in Manitoba by Sex for Metis and All Other Manitobans in Manitoba, 2002-2006

Cohort of individuals aged 10+		Premature Mortality Rate	
		All Individuals	Individuals with Depression and/or anxiety disorders
Males	Metis	7.4	5.7
	All Other Manitobans	6.6	5.7
Females	Metis	4.8*	3.9*
	All Other Manitobans	3.9	3.1

*Statistical difference between Metis and All Other Manitobans of the same sex

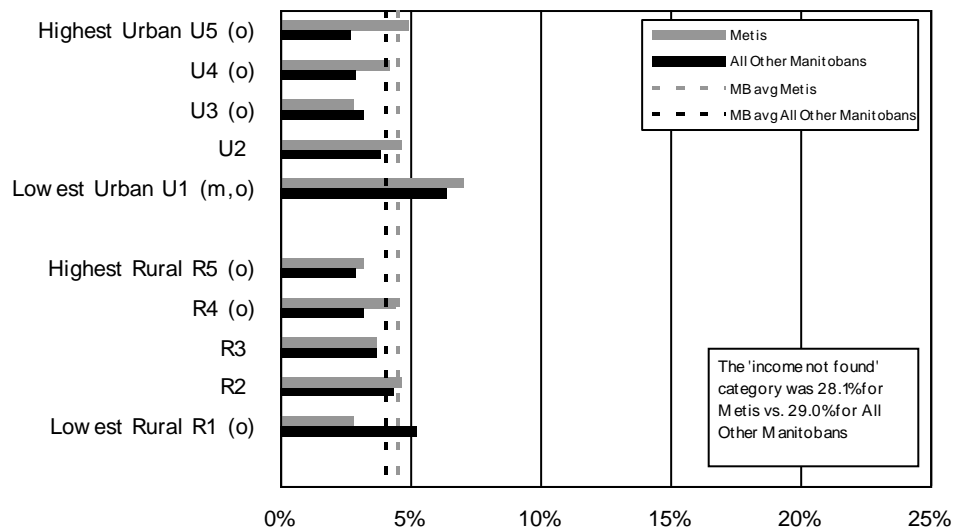
Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 3.2.3):

- **Urban:** Metis have a higher PMR compared to their provincial average in U1 (7.1 vs. 4.5 per 1,000)
- All Other Manitobans have a higher PMR compared to their provincial average in U1 (6.4 vs. 4.1 per 1,000) whereas they have a lower PMR compared to their provincial average in U5 (2.7 vs. 4.1 per 1,000), U4 (2.9 vs. 4.1), and U3 (3.2 vs. 4.1)
- **Rural:** All Other Manitobans have a higher PMR compared to their provincial average in R1 (5.2 vs. 4.1 per 1,000) whereas they have a lower PMR compared to their provincial average in R5 (2.9 vs. 4.1) and R4 (3.3 vs. 4.1)
- **Income not found:** There is no difference in PMR for Metis and All Other Manitobans in Manitoba (26.5 vs. 27.7 per 1,000)
- **Linear Trend Test:** There is no trend in PMR for either urban Metis or urban All Other Manitobans in Manitoba. There is no trend for PMR in rural Metis but there is a PMR trend for rural All Other Manitobans increasing from highest to lowest neighborhood area level income quintile

Figure 3.2.3: Premature Mortality Rate by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002-2006

Age- and sex- adjusted rate per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results

Urban Metis: Not Significant Urban All Other Manitobans: Not Significant
 Rural Metis: Not Significant Rural All Other Manitobans: Significant (p<0.001)

Findings from Literature Review

(Compared to the results in this study – *in italics*)

Individuals with mental disorders experience higher mortality rates and higher rates of premature mortality compared to the general population (Harris & Barraclough, 1998; Parks, Svendsen, Singer, & Foti, 2006; Piatt, Munetz, & Ritter, 2010). A similar phenomenon is documented for individuals with mood or depressive disorders and comorbid depressive-anxiety disorders. They showed elevated mortality rates from cardiovascular disease, nervous disorders, cancer, suicide, and other violent causes (Harris & Barraclough, 1998; Mykletun et al., 2007; Parikh et al., 2001; Wulsin, Vaillant, & Wells, 1999). However, mortality trends for those with anxiety disorders are less clear. Harris and Barraclough (1998) found that individuals with affective disorders were more likely to die prematurely compared to the general population, while those with ‘anxiety neuroses’ were no more likely to do so.

For the general population worldwide, it is clear that premature mortality rates for men are much higher than those of women (World Health Organization, 2002). This also appears to be the case for men and women with mental disorders, though rates vary depending on specific conditions. Harris and Barraclough’s study (1998) revealed that affective disorders increased the risk of premature death for both men and women. However, for individuals with anxiety neurosis, males were more likely to die early while females were not. According to an extensive epidemiological study in Finland, men aged 30 years and older with mood disorders or neurotic depression had elevated mortality rates, while men with anxiety neurosis and women with any of these three conditions did not (Joukamaa et al., 2001). The information in these studies was not specific to Metis. For the population as a whole, there is clear evidence that Metis of both sexes have a shorter life expectancy than other individuals in Canada (Michalowski, Loh, Verma, Germain, & Grenier, 2005; Tjepkema et al., 2009) and that Metis males live significantly shorter lives than All Other Manitoban males (Martens, Bartlett, et al., 2010).

There is little literature available specifically related to premature mortality rates and sex for Metis with mental disorders. Tjepkema, Wilkins, Sénécal, Guimond, & Penney (2009) found elevated mortality rates due to mental disorders for Métis women compared to non-Aboriginal women in Canada. In our study, Metis females in general have a higher sex-specific PMR compared to All Other Manitoban females (4.8 vs. 3.9 per 1,000). Similarly, Metis females with depression and/or anxiety disorders have a higher sex-specific PMR compared to All Other Manitoban females with depression and/or anxiety disorders (3.9 vs. 3.1 per 1,000).

There is substantial evidence internationally (Krieger, Rehkopf, Chen, & Waterman, 2008) and in Manitoba (Martens, Brownell, et al., 2010) that individuals suffering economic deprivation experience higher rates of premature mortality. While research concerning the relationship between premature mortality and income for individuals with mental disorders is extremely limited, one recent study in Finland found that psychological distress (depression, stress, and insomnia) was partly responsible for differences in unnatural mortality (e.g., violence, accidents, suicide) based on socioeconomic status (Talala et al., 2011).

There are no comparative studies on the relationship between income and premature mortality rate in Metis with depression and/or anxiety disorders. In this study, there is no difference in PMR between Metis and All Other Manitobans with depression and/or anxiety disorders neither provincially nor at the level of

RHAs. There was a clear PMR gradient seen for Metis increasing from Rural South to North aggregate areas.

While there are no provincial or regional differences in PMR, further investigation is warranted with regard to a higher sex-specific PMR for Metis women with depression and/or anxiety disorders compared to All Other Manitoban females with depression and/or anxiety disorders. In addition, the increase in PMR gradient for Metis with depression and/or anxiety from Rural South to North aggregate areas warrants further investigation.

References

- Eyles, J., & Birch, S. (1993). A population needs-based approach to health-care resource allocation and planning in Ontario: A link between policy goals and practice? *Canadian Journal of Public Health, 84*(2), 112-117.
- Gordis, L. (1996). *Epidemiology*. Toronto ON: W.B. Saunders Company.
- Harris, E. C., & Barraclough, B. (1998). Excess mortality of mental disorder. *British Journal of Psychiatry, 173*(1), 11-53.
- Janz, T., Seto, J., & Turner, A. (2009). *Aboriginal Peoples Survey, 2006: An overview of the health of the Métis population*. Ottawa, ON: Minister of Industry.
- Joukamaa, M., Heliövaara, M., Knekt, P., Aromaa, A., Raitasalo, R., & Lehtinen, V. (2001). Mental disorders and cause-specific mortality. *British Journal of Psychiatry, 179*(6), 498-502.
- Krieger, N., Rehkopf, D. H., Chen, J. T., Waterman, P. D., Marcelli, E., & Kennedy, M. (2008). The fall and rise of US inequities in premature mortality: 1960-2002. *PLoS Medicine, 5*(2), 227-241.
- Martens, P. J., Bartlett, J., Burland, E., Prior, H., Burchill, C., Huq, S., Romphf, L., Sanguins, J., Carter, S., & Bailly, A. (2010). *Profile of Metis health status and healthcare utilization in Manitoba: A population-based study*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Martens, P., Brownell, M., Au, W., MacWilliam, L., Prior, H., Schultz, J., ... & Serwonka, K. (2010). *Health inequities in Manitoba: Is the socioeconomic gap in health widening or narrowing over time?* Winnipeg, MB: Manitoba Centre for Health Policy.
- Merrill, R. M., & Timmreck, T. C. (2006). *Introduction to epidemiology* (4th ed.). Sudbury, MA: Jones & Bartlett Learning.
- Michalowski, M., Loh, S., Verma, R. B. P., Germain, M.-F., & Grenier, C. (2005). *Projections of the Aboriginal populations, Canada, provinces and territories*. Ottawa, ON: Statistics Canada. Retrieved from <http://www.statcan.gc.ca/pub/91-547-x/2005001/4155176-eng.htm>
- Mykletun, A., Bjerkeset, O., Dewey, M., Prince, M., Overland, S., & Stewart, R. (2007). Anxiety, depression, and cause-specific mortality: The HUNT study. *Psychosomatic Medicine, 69*(4), 323-331.
- Parikh, S. V., Lam, R. W., & the CANMAT Depression Work Group. (2001). Clinical guidelines for the treatment of depressive disorders: I. Definitions, prevalence, and health burden. *Canadian Journal of Psychiatry, 46*(Suppl. 1), 13S-20S.
- Parks, J., Svendsen, D., Singer, P., & Foti, M. E. (Eds.). (2006). *Morbidity and mortality in people with serious mental illness*. Alexandria, VA: National Association of State Mental Health Program Directors (NASMHPD) Medical Directors Council.
- Piatt, E. E., Munetz, M. R., & Ritter, C. (2010). An examination of premature mortality among decedents with serious mental illness and those in the general population. *Psychiatric Services, 61*(7), 663-668.

- Statistics Canada. (2008). *Aboriginal Peoples in Canada in 2006: Inuit, Métis and First Nations, 2006 Census*. Ottawa, ON: Statistics Canada.
- Talala, K. M., Huurre, T. M., Laatikainen, T. K. M., Martelin, T. P., Ostarno, A. I., & Prattala, R. S. (2011). The contribution of psychological distress to socio-economic differences in cause-specific mortality: A population-based follow-up of 28 years. *BMC Public Health, 11*(138), 1-8.
- Tjepkema, M., Wilkins, R., Senécal, S., Guimond, É., & Penney, C. (2009). Mortality of Métis and Registered Indian adults in Canada: An 11-year follow-up study. *Health Reports, 20*(4), 31-51.
- World Health Organization. (2002). *Global burden of disease 2001: YLLs ('000) by age, sex and cause for the year 2001*. Retrieved from <http://www.who.int/healthinfo/statistics/gbdwhosubregionyll2001.xls>
- Wulsin, L. R., Vaillant, G. E., & Wells, V. E. (1999). A systematic review of the mortality of depression. *Psychosomatic Medicine, 61*(1), 6-17.
- Young, T. K. (2005). *Population Health: Concepts and Methods*. Don Mills, ON: Oxford University Press.

Section 4: Morbidity

This section focuses on morbidity (illness) associated with depression and/or anxiety disorders. Depression and anxiety disorders are among the most common mental illnesses in Canada and the United States, with lifetime prevalence rates estimated at 10-12% for depression and 10-30% for anxiety disorders (Canadian Psychiatric Association [CPA], 2006a; Patten & Juby, 2008). A recent report from the World Health Organization notes that ‘unipolar depression’ is the single largest contributor to the overall burden of disease in middle- and high-income countries (WHO, 2008). At least 50% of individuals with either depression or anxiety disorders will also experience the other in their lifetime (Hirschfeld, 2001; Mineka, Watson, & Clark, 1998). Moreover, lifetime alcohol abuse/dependence may occur in as many as 50% of individuals with depression and/or anxiety disorders (Gratzer et al., 2004; Kessler et al., 1997). It has been estimated that 2-7% of individuals with depression commit suicide (Blair-West, Cantor, Mellsop, & Eyeson-Annan, 1999). Although these statistics for the general population are staggering, until now little information has been available on depression, anxiety disorders, and related morbidity among Metis in Manitoba.

In each of the graphs in this section, the Regional Health Authorities are ordered by the ten-year premature mortality rate (PMR). PMR shows the health regions ordered in a descending pattern from the most healthy to the least healthy. More information on ten-year PMR is provided in Section 1.

For each sub-section in this study, you will find an income quintile graph. Income quintile graphs show the distribution of each disease among the different socioeconomic categories of the Manitoba population. Please see section 1.5.2: ‘Making Sense of the Graphs’ for further information on income quintile graphs.

All indicator criteria used in this chapter were developed by the Manitoba Centre for Health Policy [MCHP] for the Metis Atlas (Martens, Bartlett et al., 2010) unless otherwise noted. In this section, prevalence rates of depression, anxiety disorders, and the combination of depression and/or anxiety disorders in Metis are compared to those of All Other Manitobans. However, prevalence rates of substance abuse and suicide completions or attempts in Metis with depression and/or anxiety disorders are compared to those of All Other Manitobans with depression and/or anxiety disorders. As noted in Section 1, the phrase ‘Metis and All Other Manitobans with depression and/or anxiety disorders’ refers to Metis with depression and/or anxiety disorders and All Other Manitobans with depression and/or anxiety disorders. Also as noted in that section, unless otherwise indicated, any mention of ‘lower’ or ‘higher’ refers to results that are statistically significant.

Indicators in this section include:

- Prevalence of depression (age- and sex-adjusted)
- Prevalence of depression (age- and sex-specific)
- Prevalence of depression (income quintile)
- Prevalence of anxiety disorders (age- and sex-adjusted)
- Prevalence of anxiety disorders (age- and sex-specific)
- Prevalence of anxiety disorders (income quintile)
- Prevalence of depression and/or anxiety disorders (age- and sex-adjusted)
- Prevalence of depression and/or anxiety disorders (age- and sex-specific)

- Prevalence of depression and/or anxiety disorders (income quintile)
- Prevalence of substance abuse (age- and sex-adjusted)
- Prevalence of substance abuse (age- and sex-specific)
- Prevalence of substance abuse (income quintile)
- Prevalence of suicide completions or attempts (age- and sex-adjusted)
- Prevalence of suicide completions or attempts (age- and sex-specific)
- Prevalence of suicide completions or attempts (income quintile)

Overall Key Findings (Table 4.0):

- Depression and its associated complications are health issues of concern for Metis in Manitoba
- There is considerable variation in rates of depression and associated comorbidities among Metis across RHAs
- In this study, the prevalence of depression is higher among Metis than All Other Manitobans (22.0% vs. 20.3%, AOR= 1.08) and the probability of developing depression and/or anxiety disorders in Metis is 1.27 times that of All Other Manitobans
- In this study, the prevalence of anxiety disorders is higher for Metis compared to All Other Manitobans (9.3% vs. 8.0%, AOR= 1.16)
- In this study, the prevalence of depression and/or anxiety disorders is higher for Metis compared to All Other Manitobans (24.4 vs. 22.6%, AOR= 1.08)
- The prevalence of substance abuse is higher for Metis than for All Other Manitobans (13.8% vs. 10.5%, AOR= 1.31)
- The prevalence of suicide completions or attempts (29.9 vs. 20.5 per 10,000) is not different for Metis compared to All Other Manitobans, and the probability of suicide completions or attempts is not higher for Metis compared to All Other Manitobans (AOR= 1.46)

Table 4.0: Overall Key Findings of Morbidity Indicators

Indicators (for individuals aged 10+)	Provincial difference between Metis and All Other Manitobans (age- and sex-adjusted treatment prevalence in %), with RR (relative risk) for Metis	Statistically better off regions for Metis with depression and/or anxiety disorders compared to provincial average for Metis with depression and/or anxiety disorders	Statistically worse off regions for Metis with depression and/or anxiety disorders compared to provincial average for Metis with depression and/or anxiety disorders
Prevalence of Depression	22.0 % vs. 20.3% RR = 1.08	Rural South aggregate area, North aggregate area, South Eastman RHA, Interlake RHA, Nor-Man RHA, and Burntwood RHA	Brandon RHA, Winnipeg RHA, Assiniboine South Winnipeg CA, River Heights Winnipeg CA, River East Winnipeg CA, Inkster Winnipeg CA, Downtown Winnipeg CA, and Point Douglas Winnipeg CA
Prevalence of Anxiety Disorders	9.3 % vs. 8.0% RR = 1.16	Rural South aggregate area, Mid aggregate area, Central RHA, Interlake RHA, North Eastman RHA, and Burntwood RHA	Brandon RHA, Winnipeg RHA, Parkland RHA, Nor-Man RHA, Transcona Winnipeg CA, River Heights Winnipeg CA, Downtown Winnipeg CA, and Point Douglas Winnipeg CA
Prevalence of Depression and/or anxiety disorders	24.4% vs. 22.6% RR = 1.08	Rural South aggregate area, Mid aggregate area, North aggregate area, South Eastman RHA, Interlake RHA, and Burntwood RHA	Brandon RHA, Winnipeg RHA, Assiniboine South Winnipeg CA, St. Vital Winnipeg CA, Transcona Winnipeg CA, River Heights Winnipeg CA, River East Winnipeg CA, Downtown Winnipeg CA, and Point Douglas Winnipeg CA
Prevalence of Substance Abuse	13.8 % vs. 10.5% RR = 1.31	Rural South aggregate area, South Eastman RHA, Interlake RHA, and Assiniboine South Winnipeg CA	North aggregate area, Brandon RHA, Winnipeg RHA, Nor-Man RHA, Burntwood RHA, River Heights Winnipeg CA, River East Winnipeg CA, Inkster Winnipeg CA, Downtown Winnipeg CA, and Point Douglas Winnipeg CA
Prevalence of Suicide Attempts or Completions	29.9 vs. 20.5 per 10,000 residents RR = 1.46, NS	None	North Aggregate Area, Assiniboine RHA, Parkland RHA, Nor-Man RHA, and Burntwood RHA

NS = No statistical difference between Metis and All Other Manitobans

4.1 Prevalence of Depression

Depression is a common mood disorder with symptoms that include depressed mood or sadness, anger, frustration, loss of interest or pleasure in activities that were once enjoyable, sleep and appetite disturbances, and feelings of worthlessness, helplessness, and guilt (Government of Canada, 2006; MCHP, 2010; Patten & Juby, 2008). While in many cases these symptoms are a natural response to life circumstances, they are generally categorized as part of a clinical disorder when they significantly impair daily functioning for an extended period of time (Parikh, Lam, & the Canadian Network for Mood and Anxiety Treatment (CANMAT) Depression Work Group, 2001).

Both the age- and sex-adjusted and the age- and sex-specific prevalence rates of depression were measured for residents aged 10 years and older over five fiscal years: 2002/03-2006/07. Residents were considered to have depression if they met one of the following conditions:

- one or more hospitalizations with a diagnosis of depressive disorder, affective psychoses, neurotic depression, or adjustment reaction: ICD-9-CM codes 296.2–296.8, 300.4, 309, 311; ICD-10-CA codes F31, F32, F33, F341, F38.0, F38.1, F41.2, F43.1, F43.2, F43.8, F53.0, F93.0
- one or more physician visits with a diagnosis of depressive disorder, affective psychoses, or adjustment reaction: ICD-9-CM codes 296, 309, 311
- one or more hospitalizations with a diagnosis for anxiety disorders: ICD-9-CM code 300; ICD-10-CA codes F32.0, F34.1, F40, F41, F42, F44, F45.0, F451, F452, F48, F68.0, F99 AND one or more prescriptions for an antidepressant or mood stabilizer: ATC codes N03AB02, N03AB52, N03AF01, N05AN01, N06A
- one or more physician visits with a diagnosis for anxiety disorders: ICD-9-CM code 300 AND one or more prescriptions for an antidepressant or mood stabilizer: ATC codes N03AB02, N03AB52, N03AF01, N05AN01, N06A

The denominator includes the total number of each of Metis and All Other Manitoban populations aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of depression in Metis, the denominator was the total number of Metis population aged 10+ years.

Key observations:

Metis and All Other Manitobans

Manitoba (Figure 4.1.1):

- Metis have a higher prevalence of depression compared to All Other Manitobans in Manitoba (22.0% vs. 20.3%)

Aggregate areas (Figure 4.1.1):

- Metis have a higher prevalence of depression compared to All Other Manitobans in Rural South (20.0% vs. 17.9%), Mid (20.2% vs. 17.8%), and North (18.0% vs. 14.6%) aggregate areas
- Metis have a lower prevalence of depression compared to their provincial average in Rural South (20.0% vs. 22.0%) and North (18.0% vs. 22.0%) aggregate areas

- All Other Manitobans have a lower prevalence of depression compared to their provincial average in Rural South (17.9% vs. 20.3%), Mid (17.8% vs. 20.3%), and North (14.6% vs. 20.3%) aggregate areas
- There is no depression prevalence gradient for Metis and All Other Manitobans among the aggregate areas as ordered by the PMR

RHAs (Figure 4.1.1):

- Metis have a higher prevalence of depression compared to All Other Manitobans in Central (20.8% vs. 17.2%), Assiniboine (20.9% vs. 17.1%), Brandon (29.3% vs. 22.3%), Winnipeg (25.7% vs. 21.3%), Interlake (19.2% vs. 17.5%), North Eastman (22.2% vs. 17.6%), Parkland (20.3% vs. 17.3%), Nor-Man (18.9% vs. 15.4%), and Burntwood (17.0% vs. 14.3%) RHAs
- Metis have a higher prevalence of depression compared to their provincial average in Brandon (29.3% vs. 22.0%) and Winnipeg (25.7% vs. 22.0%) RHAs whereas they have a lower prevalence of depression compared to their provincial average in South Eastman (18.7% vs. 22.0%), Interlake (19.2% vs. 22.0%), Nor-Man (18.9% vs. 22.0%), and Burntwood (17.0% vs. 22.0%) RHAs
- All Other Manitobans have a higher prevalence of depression compared to their provincial average in Brandon (22.3% vs. 20.3%) RHA whereas they have a lower prevalence of depression compared to their provincial average in South Eastman (17.7% vs. 20.3%), Central (17.2% vs. 20.3%), Assiniboine (17.1% vs. 20.3%), Interlake (17.5% vs. 20.3%), North Eastman (17.6% vs. 20.3%), Parkland (17.3% vs. 20.3%), Nor-Man (15.4% vs. 20.3%), and Burntwood (14.3% vs. 20.3%) RHAs
- There is no gradient for the prevalence of depression in Metis and All Other Manitobans from the most healthy to the least healthy RHAs

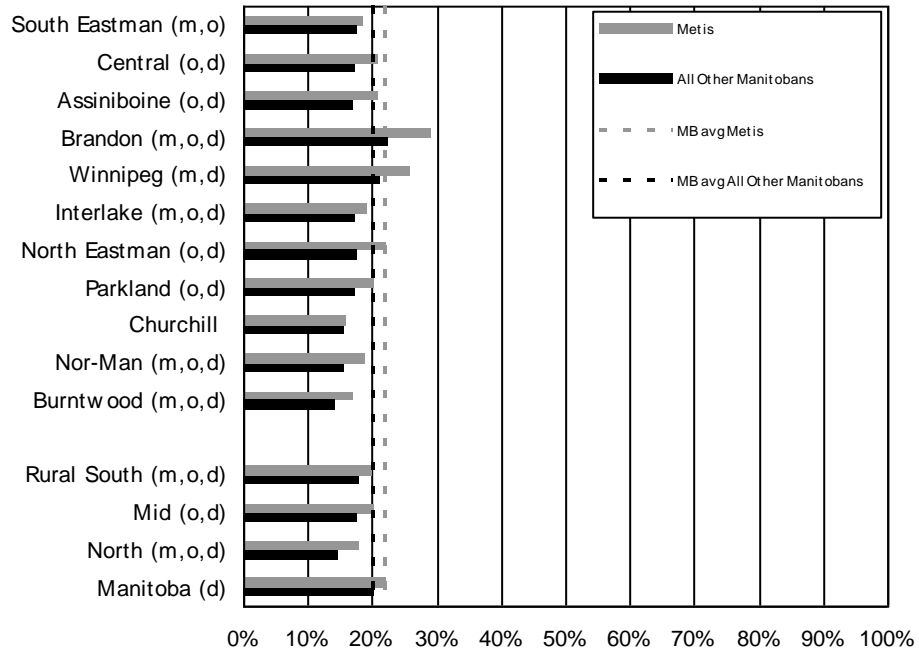
Winnipeg CAs (Figure 4.1.2):

- Metis have a higher prevalence of depression compared to All Other Manitobans in Fort Garry (22.7% vs. 17.6%), Assiniboine South (30.3% vs. 20.8%), St. Boniface (22.4% vs. 19.7%), St. Vital (24.2% vs. 19.5%), Transcona (24.4% vs. 20.1%), River Heights (27.2% vs. 22.7%), River East (26.1% vs. 20.0%), Seven Oaks (24.3% vs. 19.6%), St. James-Assiniboia (24.7% vs. 21.8%), Inkster (25.6% vs. 15.2%), Downtown (33.2% vs. 21.3%), and Point Douglas (29.1% vs. 22.8%) CAs
- Metis have a higher prevalence of depression compared to their provincial average in Assiniboine South (30.3% vs. 22.0%), River Heights (27.2% vs. 22.0%), River East (26.1% vs. 22.0%), Inkster (25.6% vs. 22.0%), Downtown (33.2% vs. 22.0%), and Point Douglas (29.1% vs. 22.0%) CAs
- All Other Manitobans have a higher prevalence of depression compared to their provincial average in River Heights (22.7% vs. 20.3%), and Point Douglas (22.8% vs. 20.3%) CAs whereas they have a lower prevalence of depression compared to their provincial average in Fort Garry (17.6% vs. 20.3%), and Inkster (15.2% vs. 20.3%) CAs

- There is no gradient for the prevalence of depression in Metis and All Other Manitobans at the CAs level

Figure 4.1.1: Prevalence of Depression by RHA for Metis and All Other Manitobans, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years

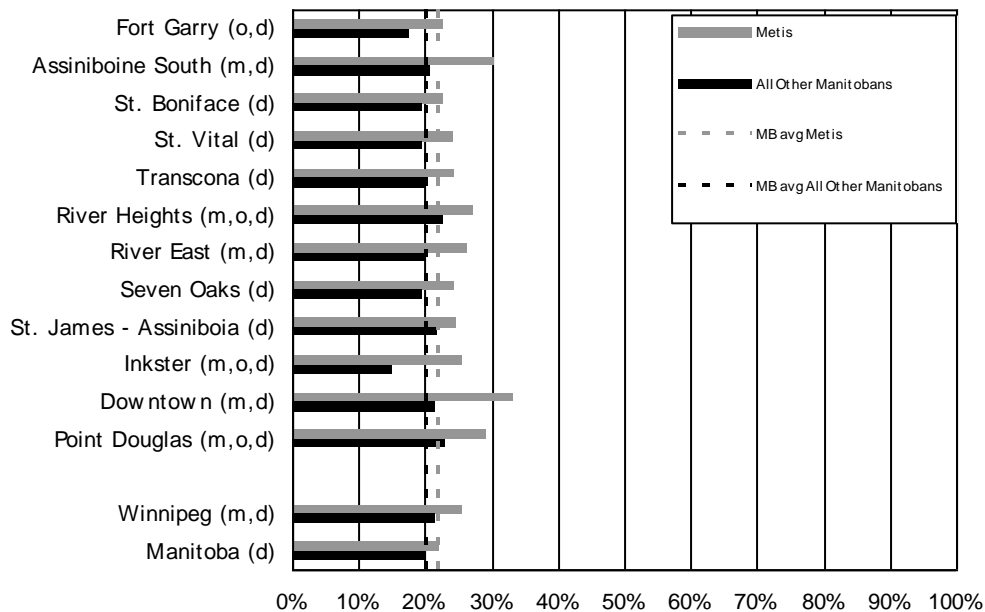


'm' indicates the area rate for Metis was statistically different from the Manitoba average for Metis
'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
'd' indicates the difference between the two groups' rates was statistically significant for this area
's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 4.1.2: Prevalence of Depression by Winnipeg Community Area for Metis and All Other Manitobans, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis was statistically different from the Manitoba average for Metis
'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
'd' indicates the difference between the two groups' rates was statistically significant for this area
's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

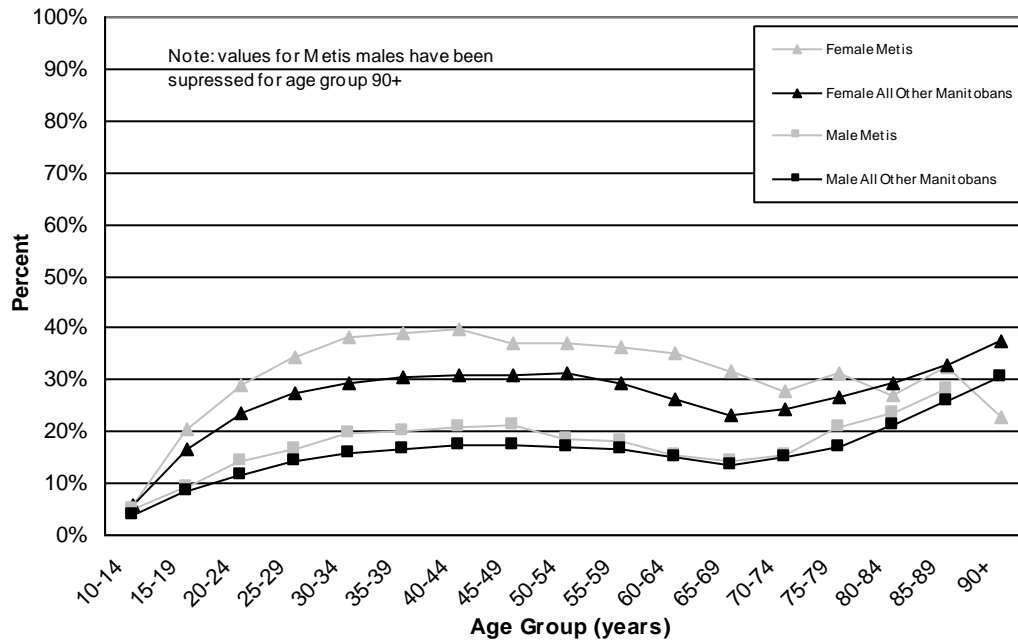
Age- and Sex-Specific:

Manitoba (Figure 4.1.3):

- The crude prevalence of depression in both Metis males and Metis females increases with age until the age of 35-39 and then remains almost stationary for the rest of their lives
- Throughout most of their lives, Metis males and Metis females have a crude prevalence rate of depression that is higher than All Other Manitoban males and All Other Manitoban females, respectively
- Metis males have a lower crude prevalence of depression compared to Metis females

Figure 4.1.3: Prevalence of Depression in Manitoba by Age and Sex for Metis and All Other Manitobans, 2002/03-2006/07

Crude percent of residents aged 10+ years



Source: MMF, 2013

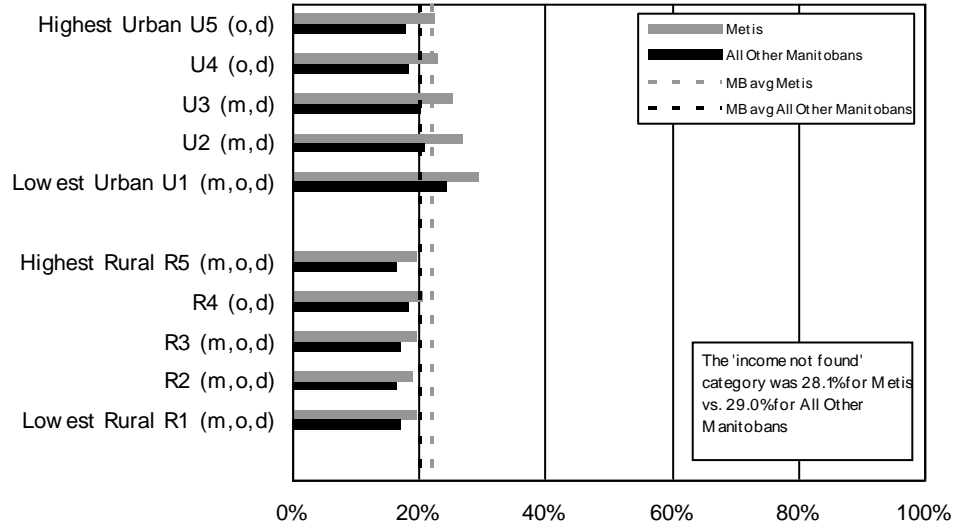
Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 4.1.4):

- **Urban:** Metis have a higher prevalence of depression than All Other Manitobans in U5 (22.4% vs. 17.9%), U4 (23.2% vs. 18.5%), U3 (25.3% vs. 20.2%), U2 (27.0% vs. 20.9%), and U1 (29.3% vs. 24.3%)
- Metis have a higher prevalence of depression compared to their provincial average in U3 (25.3% vs. 22.2%), U2 (27.0% vs. 22.2%), and U1 (29.3% vs. 22.2%)
- All Other Manitobans have a higher prevalence of depression than their provincial average in U1 (24.3% vs. 20.3%), whereas All Other Manitobans have a lower prevalence of depression compared to their provincial average in U5 (17.9% vs. 20.3%), and U4 (18.5% vs. 20.3%)
- **Rural:** Metis have a higher prevalence of depression compared to All Other Manitobans in R5 (19.7% vs. 16.3%), R4 (20.7% vs. 18.5%), R3 (19.7% vs. 17.1%), R2 (18.9% vs. 16.4%), and R1 (19.5% vs. 17.2%)
- Metis have a lower prevalence of depression compared to their provincial average in R5 (19.7% vs. 22.2%), R3 (19.7% vs. 22.2%), R2 (18.9% vs. 22.2%), and R1 (19.5% vs. 22.2%)
- All Other Manitobans have a lower prevalence of depression compared to their provincial average in R5 (16.3% vs. 20.3%), R4 (18.5% vs. 20.3%), R3 (17.1% vs. 20.3%), R2 (16.4% vs. 20.3%), and R1 (17.2% vs. 20.3%)
- **Income not found:** There is no significant difference in prevalence of depression between Metis and All Other Manitobans (28.1% vs. 29.0%) in Manitoba
- **Linear trend analysis:** For both urban Metis and All Other Manitobans, there is a trend for prevalence of depression increasing from the highest to the lowest neighborhood area-level income quintile. There is no significant linear trend, however, for the prevalence of depression in rural Metis and rural All Other Manitobans

Figure 4.1.4: Prevalence of Depression by Income Quintile in Manitoba for Metis and All Other Manitobans, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis was statistically different from the Manitoba average for Metis
 'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results

Urban Metis: Significant (p < 0.001) Urban All Other Manitobans: Significant (p < 0.001)
 Rural Metis: Not Significant Rural All Other Manitobans: Not Significant

Findings from Literature Review

(Compared to the results in this study – *in italics*):

Depression is one of the most prevalent mental disorders in Canada (Government of Canada, 2006) and internationally (WHO, 2008). Recent studies have found that in both Canada and globally at any given time, approximately 2% of the population suffers from major depression (Patten, 2002; WHO, 2008). A major review of the literature provided a best-estimate one-year prevalence of 7.5% for mood disorders and 4.1% for major depressive disorders (MDD) among individuals aged 15 years and older worldwide (Waraich, Goldner, Somers, & Hsu, 2004). One national survey in Canada provided one-year prevalence estimates for major depressive episodes (MDE) of 4.6-7.4% of residents aged 15 years and older (Patten et al., 2005). Another Manitoba-based study similar to ours, found a one-year depression prevalence of 6.8% and a five-year prevalence of 18.2% for the time period 1997/98-2001/02 (Martens et al., 2004).

There is some information related to depression in the Metis population. In a 2006 survey of the Métis population in British Columbia, 32.2% of respondents reported that they or a family member had depression, compared to 14.8% for anxiety episodes and 2.5% for schizophrenia (Hutchinson, Evans, & Reid, 2007). Nationwide, Métis reported higher levels of mood disorders in the Canadian Community Health Survey (2005) compared to the rest of the population (8.4% vs. 5.6% of individuals aged 12 years and older) (British Columbia Provincial Health Officers, 2009). The Metis Atlas found there was no significant difference in five-year treatment prevalence of depression between Metis and All Other Manitobans provincially but that there was significant regional variation with higher rates seen in Metis compared to All Other Manitobans in Assiniboine (21.2% vs. 17.4%), Brandon (28.9% vs. 22.9%), Winnipeg (25.5% vs. 21.7%), North Eastman (22.6% vs. 17.6%), Parkland (20.6% vs. 17.0%), Nor-Man (18.3% vs. 14.8%), and Burntwood (17.3% vs. 13.8%) RHAs and in every Winnipeg CA except Transcona and St. James – Assiniboia CAs (Martens, Bartlett et al., 2010).

In our study, Metis have a higher prevalence of depression compared to All Other Manitobans in Manitoba (22.0% vs. 20.3%). In addition, Metis have a higher prevalence of depression in Rural South (20.0% vs. 17.9%), Mid (20.2% vs. 17.8%), and North (18.0% vs. 14.6%) aggregate areas. Among the RHAs Metis have a higher prevalence of depression compared to All Other Manitobans in Central (20.8% vs. 17.2%), Assiniboine (20.9% vs. 17.1%), Brandon (29.3% vs. 22.3%), Winnipeg (25.7% vs. 21.3%), Interlake (19.2% vs. 17.5%), North Eastman (22.2% vs. 17.6%), Parkland (20.3% vs. 17.3%), Nor-Man (18.9% vs. 15.4%), and Burntwood (17.0% vs. 14.3%). Furthermore, among the Winnipeg CAs Metis have a higher prevalence of depression in Fort Garry (22.7% vs. 17.6%), Assiniboine South (30.3% vs. 20.8%), St. Boniface (22.4% vs. 19.7%), St. Vital (24.2% vs. 19.5%), Transcona (24.4% vs. 20.1%), River Heights (27.2% vs. 22.7%), River East (26.1% vs. 20.0%), Seven Oaks (24.3% vs. 19.6%), St. James-Assiniboia (24.7% vs. 21.8%), Inkster (25.6% vs. 15.2%), Downtown (33.2% vs. 21.3%), and Point Douglas (29.1% vs. 22.8%).

Age- and sex-specific variations in the prevalence of depression have been reported in many international studies. Martin-Merino, Ruigómez, Johansson, Wallander, & García-Rodríguez (2010) reported a general prevalence of depression of 11.3%: 7.46% in men and 14.73% in women. Among women, the highest prevalence was in those aged 30–39 years (20.39%), and this prevalence then decreased with age to 11.52% in those aged 70–79 years. The

prevalence in men followed a broadly similar trend with age but varied to a lesser degree than in women.

There is very limited information related to the influence of age and sex on prevalence of depression in the Metis population. According to results from the 2001 APS, Métis women experience higher rates of depression compared to Métis men (30% vs. 19%) (Women of the Métis Nation, 2007). *In our study throughout most of their lives, the crude prevalence of depression in Metis males and Metis females is higher than All Other Manitoban males and All Other Manitoban females, respectively.*

While individual studies such as the National Population Health Survey (NPHS) have not always demonstrated a significant relationship between socioeconomic status (SES) and depression (Statistics Canada, 1999), a meta-analysis of several studies on this relationship found that low SES was significantly correlated with depression, both in early onset and persistence of the disorder (Lorant et al., 2003). In a Manitoba study there was a clear urban versus rural difference in the prevalence of depression by income quintile. In urban areas, prevalence of depression increased significantly with decreasing quintiles, but in rural areas, there was a slight non-statistically significant gradient of depression prevalence with increasing quintiles (Martens et al., 2004).

There is no known information concerning the relationship between income and depression in the Metis population. While our study revealed no differences in the rural population, the prevalence of depression in urban Metis increases as income decreases.

There is a significant difference in prevalence of depression between Metis and All Other Manitobans provincially, in all aggregate areas, in most of RHAs (9 out of 11), and in every Winnipeg CA. These consistent findings at all geographical levels, along with the age-, sex- and income-specific variations of depression prevalence suggest the need for further investigation of the possible attributes for depression in Metis.

4.2 Prevalence of Anxiety Disorders

Anxiety disorders are a group of common mental disorders with symptoms that include excessive anxiety, worrying, avoidance, apprehension, and fear (Canadian Psychiatric Association, 2006a; Manitoba Centre for Health Policy, 2008). While in many cases these symptoms are a natural response to life events, they are generally considered as part of a clinical illness when they impair function and reduce quality of life significantly over an extended period of time (Canadian Psychiatric Association, 2006a).

Both the age- and sex-adjusted and the age- and sex-specific prevalence of anxiety disorders were measured for residents aged 10 years and older over five fiscal years: 2002/03-2006/07. Residents were considered to have an anxiety disorder if they met one of the following conditions:

- one or more hospitalizations with a diagnosis of anxiety states, phobic disorders, or obsessive-compulsive disorders: ICD-9-CM codes 300.0, 300.2, 300.3; ICD-10-CA codes F40, F41.0, F41.1, F41.3, F41.8, F41.9, F42
- three or more physician visits with a diagnosis for anxiety disorders: ICD-9-CM code 300

The denominator includes the total number of each of Metis and All Other Manitoban populations aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of anxiety disorders in Metis, the denominator is the total number of Metis population aged 10+ years.

Key observations:

Metis and All Other Manitobans

Manitoba (Figure 4.2.1):

- Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans in Manitoba (9.3% vs. 8.0%)

Aggregate areas (Figure 4.2.1):

- Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans in Rural South (7.6% vs. 6.0%), Mid (7.9% vs. 6.3%), and North (9.6% vs. 6.2%) aggregate areas
- Metis have a lower prevalence of anxiety disorders compared to their provincial average in Rural South (7.6% vs. 9.3%), and Mid (7.9% vs. 9.3%) aggregate areas
- All Other Manitobans have a lower prevalence of anxiety disorders compared to their provincial average in Rural South (6.0% vs. 8.0%), Mid (6.3% vs. 8.0%), and North (6.2% vs. 8.0%) aggregate areas
- There is a gradient in the prevalence of anxiety disorders in Metis but not All Other Manitobans increasing from the most healthy to the least healthy at the aggregate level as ordered by the PMR

RHAs (Figure 4.2.1):

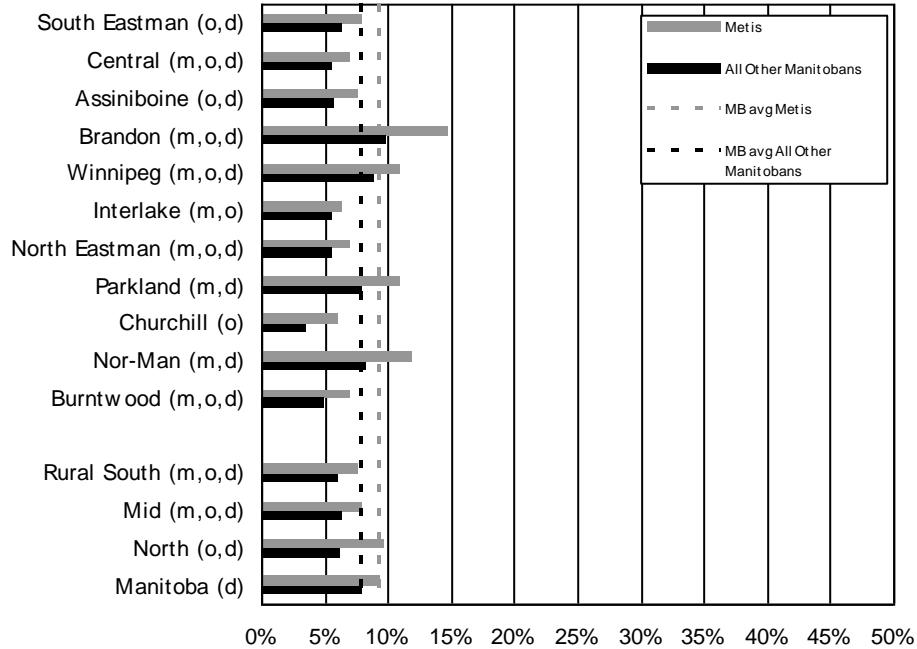
- Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans in South Eastman (8.0% vs. 6.4%), Central (6.9% vs. 5.6%), Assiniboine (7.6% vs. 5.7%), Brandon (14.7% vs. 9.8%), Winnipeg (11.0% vs. 8.8%), North Eastman (7.0% vs. 5.5%), Parkland (11.0% vs. 7.8%), Nor-Man (11.9% vs. 8.3%), and Burntwood (7.0% vs. 4.9%) RHAs
- Metis have a higher prevalence of anxiety disorders compared to their provincial average in Brandon (14.7% vs. 9.3%), Winnipeg (11.0% vs. 9.3%), Parkland (11.0% vs. 9.3%), and Nor-Man (11.9% vs. 9.3%) RHAs whereas they have a lower prevalence of anxiety disorders compared to their provincial average in Central (6.9% vs. 9.3%), Interlake (6.3% vs. 9.3%), North Eastman (7.0% vs. 9.3%), and Burntwood (7.0% vs. 9.3%) RHAs
- All Other Manitobans have a higher prevalence of anxiety disorders compared to their provincial average in Brandon (9.8% vs. 8.0%) and Winnipeg (8.8% vs. 8.0%) RHAs whereas they have a lower prevalence of anxiety disorders compared to their provincial average in South Eastman (6.4% vs. 8.0%), Central (5.6% vs. 8.0%), Assiniboine (5.7% vs. 8.0%), Interlake (5.6% vs. 8.0%), North Eastman (5.5% vs. 8.0%), Churchill (3.5% vs. 8.0%), and Burntwood (4.9% vs. 8.0%) RHAs
- There is no gradient in the prevalence of anxiety disorders in Metis and All Other Manitobans among RHAs as ordered by the PMR

Winnipeg CAs (Figure 4.2.2):

- Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans in Assiniboine South (10.7% vs. 7.9%), St. Vital (10.4% vs. 8.6%), Transcona (14.4% vs. 11.9%), River Heights (12.4% vs. 9.2%), River East (10.4% vs. 7.8%), Seven Oaks (10.5% vs. 8.2%), St. James-Assiniboia (10.5% vs. 8.0%), Downtown (15.5% vs. 10.1%), and Point Douglas (11.5% vs. 9.4%) CAs
- Metis have a higher prevalence of anxiety disorders compared to their provincial average in Transcona (14.4% vs. 9.3%), River Heights (12.4% vs. 9.3%), Downtown (15.5% vs. 9.3%), and Point Douglas (11.5% vs. 9.3%) CAs
- All Other Manitobans have a higher prevalence of anxiety disorders compared to their provincial average in St. Boniface (8.8% vs. 8.0%), Transcona (11.9% vs. 8.0%), River Heights (9.2% vs. 8.0%), Downtown (10.1% vs. 8.0%), and Point Douglas (9.4% vs. 8.0%) CAs whereas they have a lower prevalence of anxiety disorders compared to their provincial average in Fort Garry (7.2% vs. 8.0%), and Inkster (7.1% vs. 8.0%) CAs
- There is no gradient in the prevalence of anxiety disorders for Metis and All Other Manitobans at the Winnipeg CAs level as ordered by the PMR

Figure 4.2.1: Prevalence of Anxiety Disorders by RHA for Metis and All Other Manitobans, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years

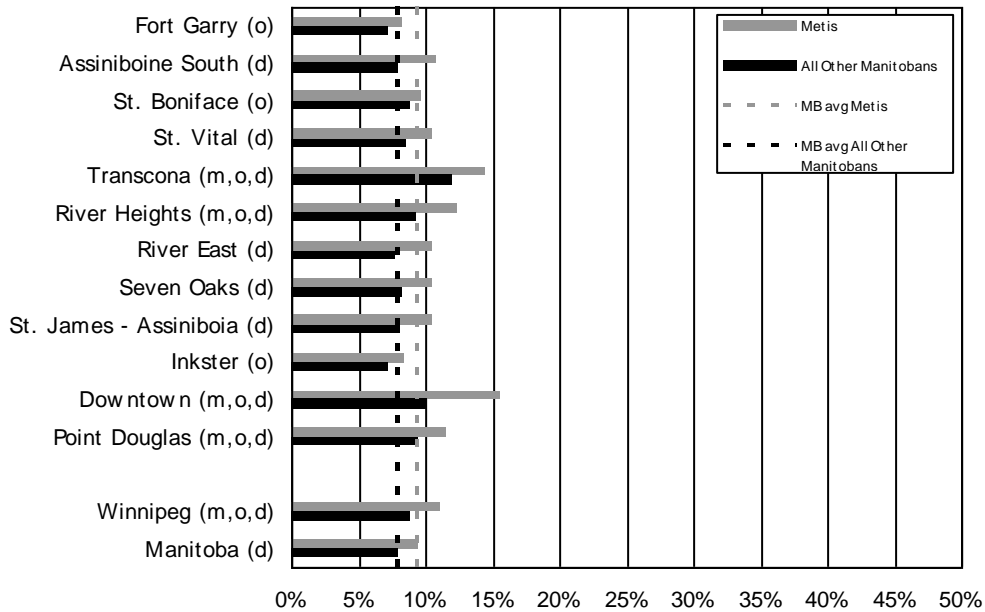


'm' indicates the area rate for Metis was statistically different from the Manitoba average for Metis
 'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 4.2.2: Prevalence of Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis was statistically different from the Manitoba average for Metis
 'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

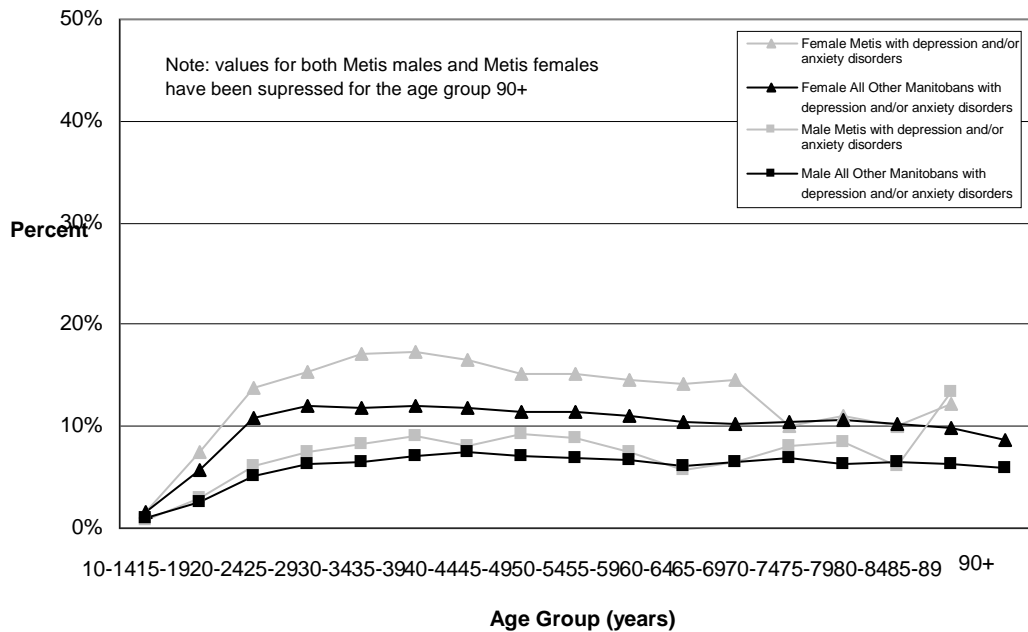
Age- and Sex-Specific:

Manitoba (Figure 4.2.3):

- Both Metis males and Metis females have an increasing prevalence of anxiety disorders until the age of 35-39 with minor variations thereafter
- There is no obvious difference in the prevalence of anxiety disorders between Metis males and All Other Manitoban males in all age groups. However, throughout most of their lives, Metis females have a higher crude prevalence of anxiety disorders compared to All Other Manitoban females.
- Metis males have a lower crude prevalence of anxiety disorders compared to Metis females

Figure 4.2.3: Prevalence of Anxiety Disorders in Manitoba by Age and Sex for Metis and All Other Manitobans, 2002/03-2006/07

Crude percent of residents aged 10+ years



Source: MMF, 2013

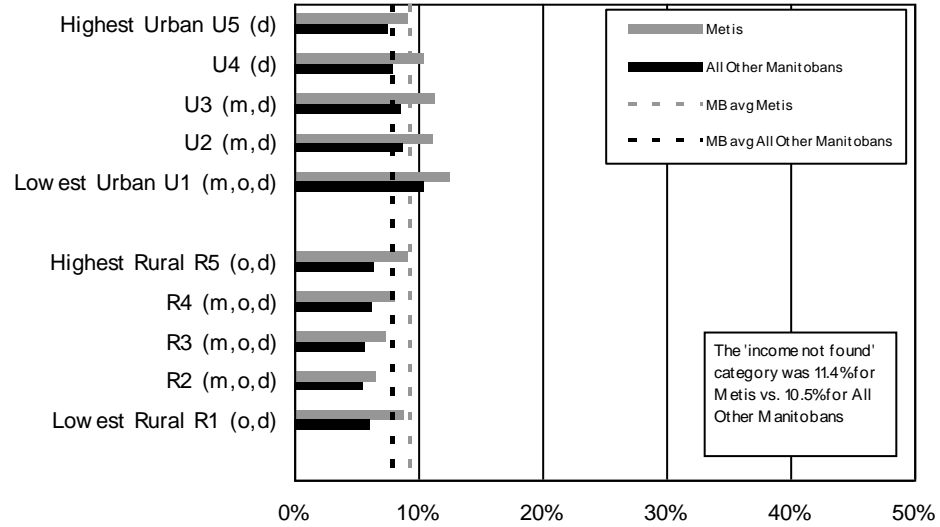
Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 4.2.4):

- **Urban:** Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans in U5 (9.3% vs. 7.6%), U4 (10.5% vs. 8.0%), U3 (11.2% vs. 8.5%), U2 (11.1% vs. 8.7%), and U1 (12.6% vs. 10.5%)
- Metis have a higher prevalence of anxiety disorders compared to their provincial average in U3 (11.2% vs. 9.4%), U2 (11.1% vs. 9.4%), and U1 (12.6% vs. 9.4%)
- All Other Manitobans have a higher prevalence of anxiety disorders compared to their provincial average in U1 (10.5% vs. 8.0%)
- **Rural:** Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans in R5 (9.2% vs. 6.4%), R4 (8.1% vs. 6.2%), R3 (7.5% vs. 5.6%), R2 (6.5% vs. 5.5%), and R1 (8.8% vs. 6.1%)
- Metis have a lower prevalence of anxiety disorders compared to their provincial average in R4 (8.1% vs. 9.4%), R3 (7.5% vs. 9.4%), and R2 (6.5% vs. 9.4%)
- All Other Manitobans have a lower prevalence of anxiety disorders compared to their provincial average in R5 (6.4% vs. 8.0%), R4 (6.2% vs. 8.0%), R3 (5.6% vs. 8.0%), R2 (5.5% vs. 8.0%), and R1 (6.1% vs. 8.0%)
- **Income not found:** There was no difference in prevalence of anxiety disorders between Metis and All Other Manitobans in Manitoba (11.4% vs. 10.5%)
- **Linear Trend Analysis:** Among the urban Metis and urban All Other Manitobans there is a trend for prevalence of anxiety disorders that is increasing from the highest to the lowest neighborhood area-level income quintiles. There is no trend for rural Metis but for rural All Other Manitobans there is a decreasing trend for anxiety disorders from the highest to the lowest neighborhood level income quintiles

Figure 4.2.4: Prevalence of Anxiety Disorders in Manitoba by Income Quintile for Metis and All Other Manitobans, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis was statistically different from the Manitoba average for Metis
 'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results

Urban Metis: Significant (p < 0.001) Urban All Other Manitobans: Significant (p < 0.001)
 Rural Metis: Not Significant Rural All Other Manitobans: Significant (p < 0.001)

Findings from Literature Review

(Compared to the results in this study – *in italics*):

Anxiety disorders are one of the most common psychiatric diagnoses internationally and the most prevalent mental illness in Canada (Canadian Psychiatric Association, 2006a; Government of Canada, 2006; WHO, 2004). A recent major review of the literature estimated that 10.6% of adults worldwide have an anxiety disorder in a one-year period (Somers, Goldner, Waraich, & Hsu, 2006). In Manitoba, the prevalence of anxiety disorders was 1.3% for those aged 10 years and older in the period of 1997/98-2001/02 (Martens et al., 2004).

In a 2006 survey of British Columbia Métis, 14.8% of respondents reported that they or a family member had anxiety attacks compared to 32.2% for depression and 2.5% for schizophrenia (Hutchinson et al., 2007). In the 2005 Canadian Community Health Survey (CCHS), Métis aged 12 years and older reported higher levels of anxiety than did non-Aboriginals (6.6% vs. 4.3%) (British Columbia Provincial Health Officers, 2009). The Metis Atlas reported a higher five-year prevalence of anxiety disorders for Metis compared to All Other Manitobans provincially (9.4% vs. 8.0%) and in almost every RHA.

In the current study, Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans (9.3% vs. 8.0%) in Manitoba. Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans in Rural South (7.6% vs. 6.0%), Mid (7.9% vs. 6.3%), and North (9.6% vs. 6.2%) aggregate areas. Among the RHAs, Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans in South Eastman (8.0% vs. 6.4%), Central (6.9% vs. 5.6%), Assiniboine (7.6% vs. 5.7%), Brandon (14.7% vs. 9.8%), Winnipeg (11.0% vs. 8.8%), North Eastman (7.0% vs. 5.5%), Parkland (11.0% vs. 7.8%), Nor-Man (11.9% vs. 8.3%), and Burntwood (7.0% vs. 4.9%). Among the Winnipeg CAs Metis have a higher prevalence of anxiety disorders compared to All Other Manitobans in Assiniboine South (10.7% vs. 7.9%), St. Vital (10.4% vs. 8.6%), Transcona (14.4% vs. 11.9%), River Heights (12.4% vs. 9.2%), River East (10.4% vs. 7.8%), Seven Oaks (10.5% vs. 8.2%), St. James-Assiniboia (10.5% vs. 8.0%), Downtown (15.5% vs. 10.1%), and Point Douglas (11.5% vs. 9.4%).

The overall prevalence of generalized anxiety disorders seems to be variable according to the study population, the method of diagnosis, and the informant of symptoms (Hirschfeld, 2001). The prevalence of anxiety disorders increases with the progress of age in both sexes until it gradually decreases at the age of 75 in males and 65 in females (Sartorius et al., 1996).

Throughout most of their lives, Metis females have higher crude prevalence of anxiety disorders compared to All Other Manitoban females, however, the difference between Metis males and All Other Manitoban males is not constantly obvious throughout all age groups.

There is evidence that prevalence rates of anxiety disorders are higher for individuals in lower income groups, especially in urban areas. Martens et al. (2004) found an increase in the prevalence of anxiety disorders for both sexes with each drop in income quintile in urban Manitoba. In rural Manitoba, however, there was no relationship with income for females and a very slight direct relationship for males (rates decreasing slightly with each decrease in income quintile). In Canada results from the 2002 CCHS show that while prevalence of anxiety disorders was twice as high for women compared to men in the 15-24 years age group, this sex ratio decreased to 1.7 times for those aged 25-44 years and 1.4 times for those aged 45-64 years. Counts were too low for comparison for those in the 65 years and older age group (Government of Canada, 2006).

There is no known information specific to income and anxiety disorders in the Metis population. In our study *prevalence of anxiety disorders among urban Metis increases as neighborhood area-level income decreases*. Clearly, the higher prevalence of anxiety disorders at the provincial level, aggregate areas, RHAs, and Winnipeg CAs among Metis in Manitoba requires further investigation.

4.3 Prevalence of Depression and/or Anxiety Disorders

In the ‘depression, anxiety disorders and related healthcare utilization in Manitoba Metis population’ study, the category ‘depression and/or anxiety disorders’ includes individuals with depression only, anxiety disorders only, or comorbid depression and anxiety disorders.

Both the age- and sex-adjusted and the age- and sex-specific prevalence of depression and/or anxiety disorders were measured for residents aged 10 years and older over five fiscal years: 2002/03–2006/07. Residents were considered to have depression and/or anxiety disorders if they met one of the conditions for depression (sub-section 4.1) or anxiety disorders (sub-section 4.2).

The denominator includes the total number of each of Metis and All Other Manitoban populations aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of depression and/or anxiety disorders in Metis, the denominator is the total number of Metis population aged 10+ years.

Key observations:

Metis and All Other Manitobans

Manitoba (Figure 4.3.1):

- Metis in Manitoba have a higher prevalence of depression and/or anxiety disorders compared to All Other Manitobans in Manitoba (24.4% vs. 22.6%)

Aggregate areas (Figure 4.3.1):

- Metis have a higher prevalence of depression and/or anxiety disorders compared to All Other Manitobans in Rural South (22.0% vs. 19.3%), Mid (22.1% vs. 19.5%), and North (21.0% vs. 16.7%) aggregate areas
- Metis have a lower prevalence of depression and/or anxiety disorders compared to their provincial average in Rural South (22.0% vs. 24.4%), Mid (22.1% vs. 24.4%), and North (21.0% vs. 24.4%) aggregate areas
- All Other Manitobans have a lower prevalence of depression and/or anxiety disorders compared to their provincial average in Rural South (19.3% vs. 22.6%), Mid (19.5% vs. 22.6%), and North (16.7% vs. 22.6%) aggregate areas
- There is no gradient in the prevalence of depression and/or anxiety disorders in Metis and All Other Manitobans at the aggregate areas as ordered by the PMR

RHAs (Figure 4.3.1):

- Metis have a higher prevalence of depression and/or anxiety disorders compared to All Other Manitobans in Central (22.3% vs. 18.5%), Assiniboine (22.6% vs. 18.5%), Brandon (32.4% vs. 25.0%), Winnipeg (28.5% vs. 24.1%), Interlake (20.6% vs. 18.9%), North Eastman (23.4% vs. 18.9%), Parkland (23.1% vs. 19.7%), Nor-Man (23.2% vs. 18.5%), and Burntwood (18.6% vs. 15.5%) RHAs
- Metis have a higher prevalence of depression and/or anxiety disorders compared to their provincial average in Brandon (32.4% vs. 24.4%), and Winnipeg (28.5% vs. 24.4%)

24.4%) RHAs whereas they have a lower prevalence of depression and/or anxiety disorders compared to their provincial average in South Eastman (21.2% vs. 24.4%), Interlake (20.6% vs. 24.4%), and Burntwood (18.6% vs. 24.4%) RHAs

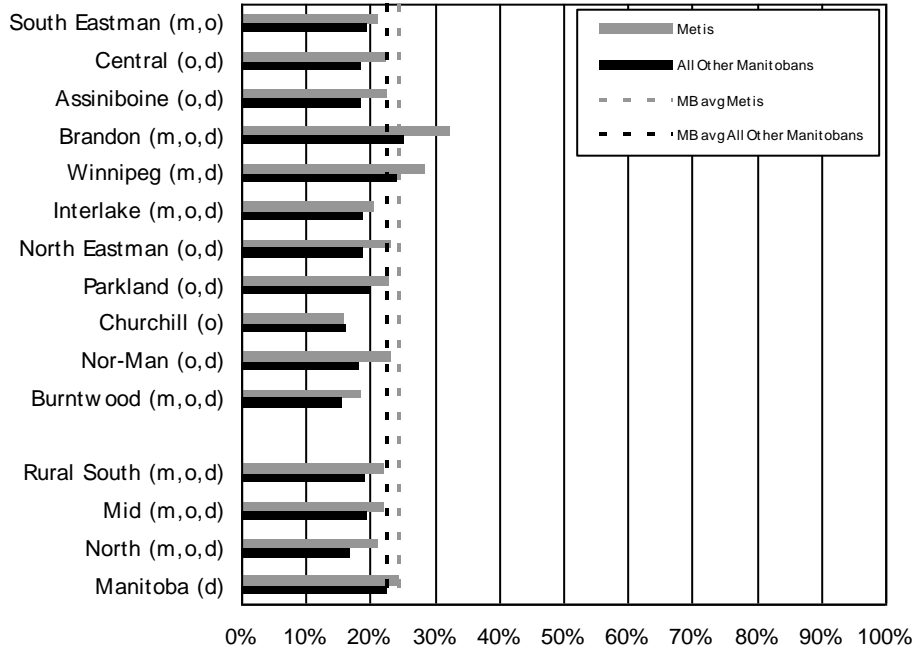
- All Other Manitobans have a higher prevalence of depression and/or anxiety disorders compared to their provincial average in Brandon RHA (25.0% vs. 22.6%) whereas they have a lower prevalence of depression and/or anxiety disorders compared to their provincial average in South Eastman (19.5% vs. 22.6%), Central (18.5% vs. 22.6%), Assiniboine (18.5% vs. 22.6%), Interlake (18.9% vs. 22.6%), North Eastman (18.9% vs. 22.6%), Parkland (19.7% vs. 22.6%), Churchill (16.2% vs. 22.6%), Nor-Man (18.5% vs. 22.6%), and Burntwood (15.5% vs. 22.6%) RHAs
- There is no gradient in the prevalence of depression and/or anxiety disorders in Metis and All Other Manitobans at the RHA level

Winnipeg CAs (Figure 4.3.2):

- Metis have a higher prevalence of depression and/or anxiety disorders compared to All Other Manitobans in Fort Garry (25.3% vs. 20.1%), Assiniboine South (33.5% vs. 23.3%), St. Boniface (24.9% vs. 22.7%), St. Vital (27.7% vs. 22.6%), Transcona (29.3% vs. 25.3%), River Heights (30.4% vs. 25.4%), River East (28.5% vs. 22.4%), Seven Oaks (26.6% vs. 22.4%), St. James – Assiniboia (27.6% vs. 24.2%), Inkster (27.1% vs. 18.0%), Downtown (36.4% vs. 24.5%), and Point Douglas (31.1% vs. 25.3%) CAs
- Metis have a higher prevalence of depression and/or anxiety disorders compared to their provincial average in Assiniboine South (33.5% vs. 24.4%), St. Vital (27.7% vs. 24.4%), Transcona (29.3% vs. 24.4%), River Heights (30.4% vs. 24.4%), River East (28.5% vs. 24.4%), Downtown (36.4% vs. 24.4%), and Point Douglas (31.1% vs. 24.4%) CAs
- All Other Manitobans have a higher prevalence of depression and/or anxiety disorders compared to their provincial average in Transcona (25.3% vs. 22.6%), River Heights (25.4% vs. 22.6%), Downtown (24.5% vs. 22.6%), and Point Douglas (25.3% vs. 22.6%) Winnipeg CAs whereas they have a lower prevalence of depression and/or anxiety disorders compared to their provincial average in Fort Garry (20.1% vs. 22.6%), and Inkster (18.0% vs. 22.6%) CAs
- There is no gradient in the prevalence of depression and/or anxiety disorders in Metis and All Other Manitobans at the Winnipeg CA level

Figure 4.3.1: Prevalence of Depression and/or Anxiety Disorders by RHA for Metis and All Other Manitobans, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years

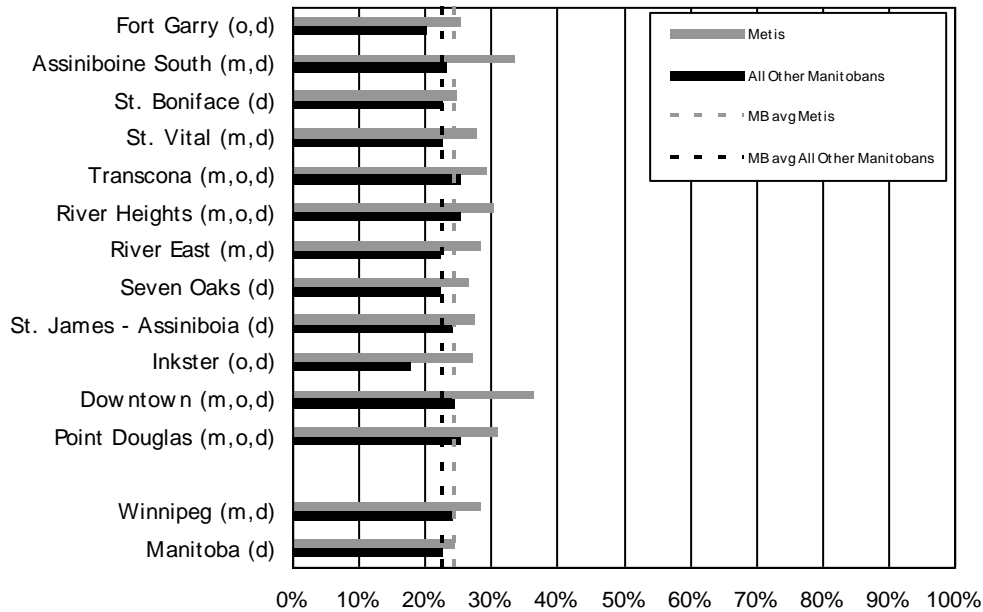


'm' indicates the area rate for Metis was statistically different from the Manitoba average for Metis
 'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 4.3.2: Prevalence of Depression and/or Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis was statistically different from the Manitoba average for Metis
 'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

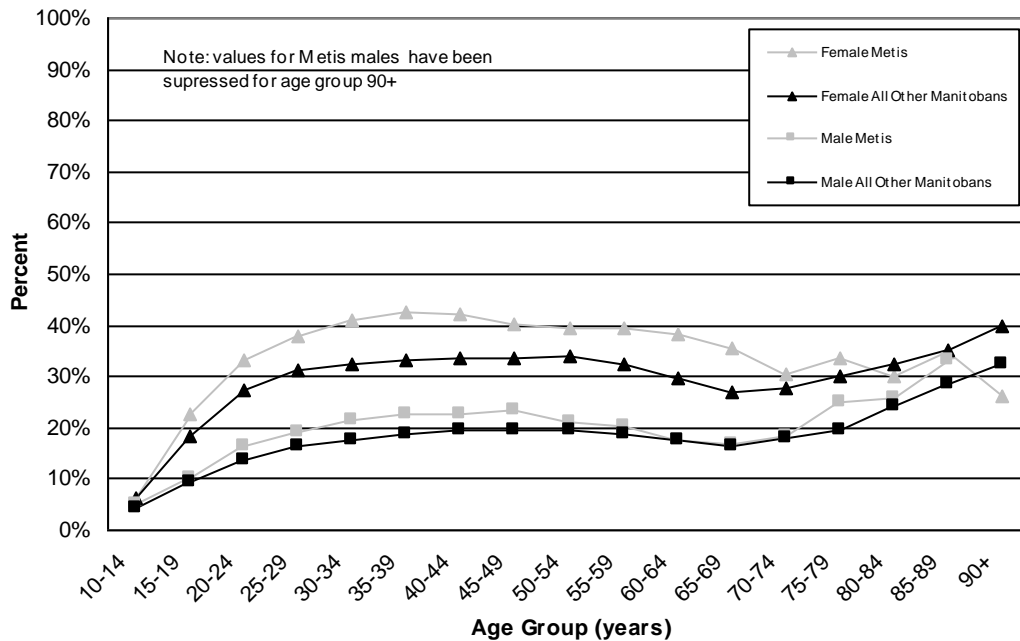
Source: MMF, 2013

Age- and Sex-Specific:

Manitoba (Figure 4.3.3):

- For both Metis males and Metis females, the crude prevalence of depression and/or anxiety disorders increases until age group 45-49 years after which it decreases until age group 75-79 years
- Metis males have a higher crude prevalence of depression and/or anxiety disorders compared to All Other Manitoban males. For Metis females the crude prevalence rate of depression and/ or anxiety disorder is higher than that of All Other Manitoban females until the age group of 50-54
- Metis males have a lower crude prevalence of depression and/or anxiety disorders compared to Metis females

Figure 4.3.3: Prevalence of Depression and/or Anxiety Disorders in Manitoba by Age and Sex for Metis and All Other Manitobans, 2002/03-2006/07
Crude percent of residents aged 10+ years



Source: MMF, 2013

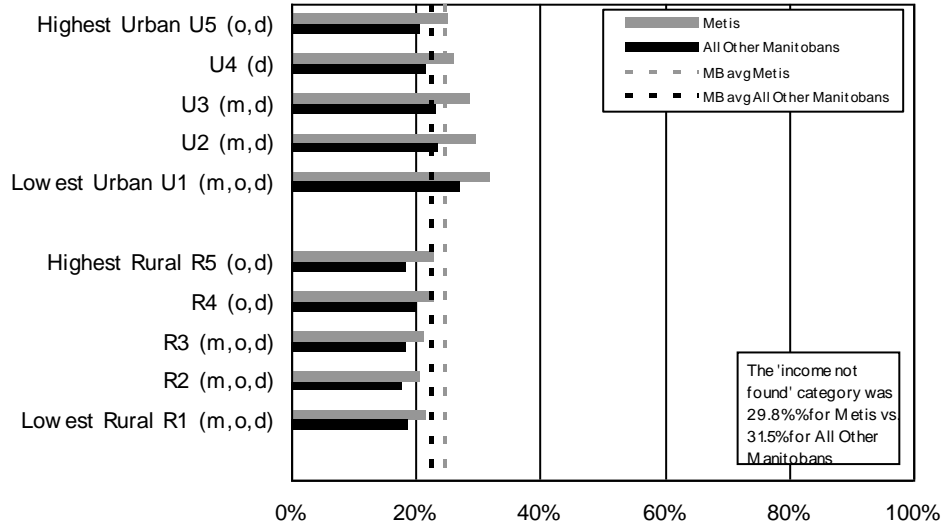
Age- and Sex-Adjusted Income Quintile:

Manitoba (Figure 4.3.4):

- **Urban:** Metis have a higher prevalence of depression and/or anxiety disorders compared to All Other Manitobans in U5 (25.2% vs. 20.6%), U4 (26.2% vs. 21.4%), U3 (28.6% vs. 23.1%), U2 (29.7% vs. 23.6%), and U1 (31.7% vs. 27.2%)
- Metis have a higher prevalence of depression and/or anxiety disorders compared to their provincial average in U3 (28.6% vs. 24.6%), U2 (29.7% vs. 24.6%), and U1 (31.7% vs. 24.6%)
- All Other Manitobans have a higher prevalence of depression and/or anxiety disorders compared to their provincial average in U1 (27.2% vs. 22.6%) whereas they have a lower prevalence of depression and/or anxiety disorders compared to their provincial average in U5 (20.6% vs. 22.6%)
- **Rural:** Metis have a higher prevalence of depression and/or anxiety disorders compared to All Other Manitobans in R5 (22.7% vs. 18.4%), R4 (22.8% vs. 20.1%), R3 (21.3% vs. 18.5%), R2 (20.6% vs. 17.7%), and R1 (21.4% vs. 18.6%)
- Metis have a lower prevalence of depression and/or anxiety disorders compared to their provincial average in R3 (21.3% vs. 24.6%), R2 (20.6% vs. 24.6%), and R1 (21.4% vs. 24.6%)
- All Other Manitobans have a lower prevalence of depression and/or anxiety disorders compared to their provincial average in R5 (18.4% vs. 22.6%), R4 (20.1% vs. 22.6%), R3 (18.5% vs. 22.6%), R2 (17.7% vs. 22.6%), and R1 (18.6% vs. 22.6%)
- **Income not found:** There was no difference in prevalence of depression and/or anxiety disorders between Metis and All Other Manitobans in Manitoba (29.8% vs. 31.5%)
- **Linear Trend Test:** For both urban Metis and urban All Other Manitobans there is an increasing trend for the prevalence of depression and/or anxiety as income quintiles decrease. For rural Metis, but not for rural All Other Manitobans, the prevalence of depression and/or anxiety disorders decreases as income quintiles decrease

Figure 4.3.4: Prevalence of Depression and/or Anxiety Disorders in Manitoba by Income Quintile for Metis and All Other Manitobans, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis was statistically different from the Manitoba average for Metis
 'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results

Urban Metis: Significant (p < 0.001) Urban All Other Manitobans: Significant (p < 0.001)
 Rural Metis: Significant (p < 0.001) Rural All Other Manitobans: Not significant

**Key observations:
Metis and All Other Manitobans**

Logistic regression (Table 4.3.1):

- Metis are at a greater risk of developing depression and/or anxiety disorders compared to All Other Manitobans (aOR 1.27, 95% CI 1.24-1.30)
- Manitobans in Brandon and Winnipeg RHAs have a higher risk of developing depression and/or anxiety disorders compared to Manitobans living elsewhere, after controlling for other factors (aOR 1.30, 95% CI 1.28-1.33 and aOR 1.22, 95% CI 1.21-1.23; respectively)
- Manitobans with substance abuse have a higher risk of developing depression and/or anxiety disorders compared to those without substance abuse (aOR 3.51, 95% CI 3.44-3.58) after controlling for other factors
- Manitobans with schizophrenia have a higher risk of developing depression and/or anxiety disorders compared to those without schizophrenia (aOR 4.47, 95% CI 4.25-4.71) after controlling for other factors
- Manitobans with personality disorders have a higher risk of developing depression and/or anxiety disorders compared to those without personality disorders (aOR 17.41, 95% CI 16.33-18.57) after controlling for other factors
- Risk of developing depression and/or anxiety disorders increases with age (aOR 1.06, 95% CI 1.06-1.06)
- Manitobans with a major physical illness have a higher risk of developing depression and/or anxiety disorders compared to those without a major physical illness (aOR 1.59, CI 1.57-1.61) after controlling for other factors

Table 4.3.1: Logistic Regression Modeling of the Possible Risk Factors of Depression and/or Anxiety Disorders, 2002/03-2006/07

Probability of Depression and/or Anxiety Disorders by Aggregate Region for Residents Aged 10+ years

Covariates	Adjusted Odds Ratio (95% Confidence Interval)	p-value
Metis (vs. All Other Manitobans)	1.271 (1.245-1.297)	<0.001
Aggregate Regions (ref=Manitoba)		
South	0.920 (0.909-0.931)	<0.001
Mid	0.965 (0.952-0.977)	<0.001
North	0.710 (0.696-0.724)	<0.001
Brandon	1.303 (1.278-1.319)	<0.001
Winnipeg	1.218 (1.207-1.229)	<0.001
Substance Abuse	3.510 (3.439-3.581)	<0.001
Schizophrenia	4.473 (4.245-4.713)	<0.001
Personality Disorders	17.414 (16.335-18.565)	<0.001
Age, linear	1.063 (1.062-1.064)	<0.001
Age, quadratic	0.999 (0.999-0.999)	<0.001
Males (vs. Females)	0.447 (0.443-0.452)	<0.001
Average Household Income of Neighborhood	0.982 (0.979-0.984)	<0.001
Major Physical Illness ADGs	1.590 (1.571-1.608)	<0.001

Bold = statistically significant results

Note: Please see Glossary for definition of all variables

Source: MMF, 2013

Findings from Literature Review

(Compared to the results in this study – *in italics*):

It has been reported that the majority of individuals who experience one psychiatric disorder during their lifetime will develop at least two or more mental illnesses throughout their life (Hirschfeld, 2001). This also appears to be the case for individuals with depression (Hirschfeld, 2001; Kessler et al., 1994; Kessler et al., 2003). There is considerable evidence that individuals with depression are more likely to develop anxiety disorders than those who did not have previous episodes of depression. In addition, individuals with anxiety disorders are more likely to experience depression. In terms of the prognosis, comorbid depression-anxiety is considered a predictor of severity and chronicity of the condition than either disorder alone (Canadian Psychiatric Association, 2006b; Patten & Juby, 2008).

As shown in sub-sections 4.1 and 4.2, the one-year prevalence rates in Canada are approximately 4-8% for depression and 1-12% for anxiety disorders. It is estimated that at least one-half of individuals with either of these conditions will have also had the other in their lifetime (Hirschfeld, 2001; Mineka, Watson, & Clark, 1998). During the period of 1997/98-2001/02 in Manitoba, 68.5% of individuals diagnosed with an anxiety disorder were also diagnosed with depression, and 25.1% of individuals diagnosed with depression were diagnosed with an anxiety disorder later in their life (Martens et al., 2004). In that study, the prevalence of the comorbid depression and anxiety disorders was 20.2%. A major review of the literature estimated that 25-50% of youth with depression also have a comorbid anxiety disorder, and 10-15% of youth with an anxiety disorder have comorbid depression (Axelson & Birmaher, 2001). For the elderly, those with anxiety disorders are more likely to have major depression than those without (CPA, 2006b). Results from the 2002 CCHS show that 23.0% of individuals aged 55 years and older who met criteria for major depression in the past year also met criteria for a recent anxiety disorder (Cairney, Corna, Veldhuizen, Herrmann, & Streiner, 2008).

With the exception of the Metis Atlas, there is little information available about depression and anxiety disorders in Metis. In that study, 31.8% of Metis diagnosed with depression also had a diagnosis of one or more anxiety disorders, while 75.9% of Metis diagnosed with an anxiety disorder developed depression later in their life (Martens, Bartlett, et al., 2010). Although Metis appeared to have greater crude rates of comorbid depression and/or anxiety disorders than All Other Manitobans (25.7% vs. 21.6%, respectively), the differences in rates were not tested for statistical significance in that report. In our study, Metis have a higher prevalence of depression and/or anxiety disorders compared to All Other Manitobans provincially, in every aggregate geographical area, in Central, Assiniboine, Brandon, Winnipeg, Interlake, North Eastman, Parkland, Nor-Man, and Burntwood RHAs, and in all Winnipeg CAs. In the Metis Atlas, prevalence of comorbid depression and anxiety disorders was higher in Metis than All Other Manitobans (5.37% vs. 3.99%) (Martens, Bartlett, et al., 2010).

For individuals with depression, females are three times as likely as males to have a comorbid anxiety disorder (Thorpe et al., 2001). A study using WHO survey results found that the prevalence of comorbid depression and anxiety disorders changed little from 18-34 years through 65 years and older, suggesting it is not an age-specific comorbidity (Kessler et al., 2010). A cross-sectional study on a representative sample from seven countries (5 Latin American countries as well as India and China) reported a prevalence estimate for comorbid anxiety and depression ranging from 0.3% (in rural India) to 4.5% (in urban Peru). A similar pattern of higher prevalence among younger age groups (20-35), females, and people with lower educational level was found across the study sites. The association between female

gender and comorbid depression and anxiety was the strongest risk factor revealed in this study (Prina, Ferri, Guerra, Brayne, & Prince, 2011)

There are no known studies about age- and sex-specific rates of comorbid depression and anxiety disorders in Metis. In our study throughout most of their lives, Metis males have a higher crude prevalence of depression and/or anxiety disorders compared to All Other Manitoban males. However, in Metis females the crude prevalence rate of depression and/or anxiety disorders is higher than that of All Other Manitoban females until the age of 50-54.

Sturm and Gresenz (2002) noted a clear income gradient for depression and anxiety disorders, with rates increasing for every decrease in income group. Another study found that the likelihood of comorbid occurrence of depression and anxiety disorders was approximately 2.5 times higher for youth of low socioeconomic status (SES) compared to those of high SES (Lemstra et al., 2008). We know from national and provincial sources that income among Métis was significantly lower than others in the population (Manitoba-Manitoba Metis Federation Policy Committee, 2010; Normand, 1996; United Way Winnipeg, 2010).

There is little information about the relationship between prevalence of comorbid depression-anxiety and income for Metis. The Metis Atlas revealed that the likelihood of cumulative mental illness (CMI) diagnosis, including diagnosis of depression and anxiety disorders, decreased with increasing income for both Metis and All Other Manitobans (Martens, Bartlett, et al., 2010). In our study urban Metis have a trend for prevalence of depression and/or anxiety disorders that increases as neighborhood area-level income quintiles decrease whereas rural Metis have a trend for prevalence of depression and/or anxiety disorders that slightly decreases as neighborhood-income quintiles decrease.

The information contained in this sub-section confirms that the comorbidity of depression and/or anxiety disorders is a challenging major health problem that may highly impair the productivity and the quality of life of Metis in Manitoba. This information suggests that it would be beneficial to target depression and anxiety disorders in Metis through well-designed and well-financed mental health programs.

4.4 Prevalence of Substance Abuse

Substances such as psychoactive drugs are used by many individuals for their ability to enhance moods, to assist in coping with stress and anxiety, or to satisfy a dependency that has developed (Health Officers Council of British Columbia, 2005). Unfortunately, these substances, as well as many others, may result in substance abuse if improperly used. Substance abuse is defined as a patterned use of a substance (drug) in which the user consumes the substance in amounts or with methods neither approved nor supervised by medical professionals (Ksir & Ray, 2002). Many negative outcomes may occur as a result of substance abuse including failures to meet obligations in everyday life, extensive interpersonal problems, dangerous behaviors, repeated conflicts with law enforcement, or otherwise negatively affects the well-being of the individual and others close to him or her (Government of Canada, 2006; Martens, Bartlett, et al., 2010).

Both the age- and sex-adjusted and the age- and sex-specific prevalence of substance abuse were measured for residents with depression and/or anxiety disorders aged 10 years and older over five fiscal years: 2002/03-2006/07. Residents were considered to have substance abuse if they met one of the following conditions:

- one or more hospitalizations with a diagnosis for alcoholic or drug psychoses, alcohol or drug dependence, or nondependent abuse of drugs: ICD-9-CM codes 291, 292, 303, 304, 305; ICD-10-CA codes F10-F19, F55
- A hospitalization with a diagnosis code for accidental poisoning: ICD-9-CM codes 965, 967, 969, 977.9

The denominator includes the total number of each of Metis and All Other Manitoban populations with depression and/or anxiety disorders aged 10 years and older continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of substance abuse in Metis, the denominator is the total number of Metis population with depression and/or anxiety disorders aged 10+ years.

Key observations:

Metis and All Other Manitobans with depression and/or anxiety disorders

Manitoba (Figure 4.4.1):

- Metis have a higher substance abuse prevalence compared to All Other Manitobans in Manitoba (13.8% vs. 10.5%)

Aggregate areas (Figure 4.4.1):

- Metis have a higher prevalence of substance abuse compared to All Other Manitobans in Rural South (10.4% vs. 8.6%), and Mid (12.2% vs. 9.7%) aggregate areas whereas Metis have a lower prevalence of substance abuse compared to All Other Manitobans in North aggregate area (19.9% vs. 20.5%)
- Metis have a higher prevalence of substance abuse compared to their provincial average in North aggregate area (19.9% vs. 13.8%) whereas they have a lower prevalence of substance abuse compared to their provincial average in Rural South aggregate area (10.4% vs. 13.8%)

- All Other Manitobans have a higher prevalence of substance abuse compared to their provincial average in North aggregate area (20.5% vs. 10.5%) whereas they have a lower prevalence of substance abuse compared to their provincial average in Rural South (8.6% vs. 10.5%) and Mid (9.7% vs. 10.5%) aggregate areas
- There is an increasing gradient for the prevalence of substance abuse in Metis and All Other Manitobans from the most healthy to the least healthy at the aggregate areas as ordered by the PMR

RHAs (Figure 4.4.1):

- Metis have a higher prevalence of substance abuse compared to All Other Manitobans in Central (11.1% vs. 8.0%), Assiniboine (14.3% vs. 10.0%), Brandon (19.8% vs. 12.6%), Winnipeg (14.5% vs. 10.1%), Interlake (10.0% vs. 8.4%), North Eastman (10.2% vs. 9.8%), Parkland (16.5% vs. 12.2%), and Nor-Man (17.2% vs. 16.2%) RHAs whereas Metis have a lower prevalence of substance abuse than All Other Manitobans in Burntwood RHA (23.2% vs. 25.1%)
- Metis have a higher prevalence of substance abuse compared to their provincial average in Brandon (19.8% vs. 13.8%), Winnipeg (14.5% vs. 13.8%), Nor-Man (17.2% vs. 13.8%), and Burntwood (23.2% vs. 13.8%) RHAs whereas they have a lower prevalence of substance abuse compared to their provincial average in South Eastman (8.7% vs. 13.8%), and Interlake (10.0% vs. 13.8%) RHAs
- All Other Manitobans have a higher prevalence of substance abuse compared to their provincial average in Brandon (12.6% vs. 10.5%), Parkland (12.2% vs. 10.5%), Nor-Man (16.2% vs. 10.5%), and Burntwood (25.1% vs. 10.5%) RHAs whereas they have a lower prevalence of substance abuse compared to their provincial average in South Eastman (8.5% vs. 10.5%), Central (8.0% vs. 10.5%), Assiniboine (10.0% vs. 10.5%), Interlake (8.4% vs. 10.5%), and North Eastman (9.8% vs. 10.5%) RHAs
- There is no gradient for the prevalence of substance abuse in Metis and All Other Manitobans at the RHA level

Winnipeg CAs (Figure 4.4.2):

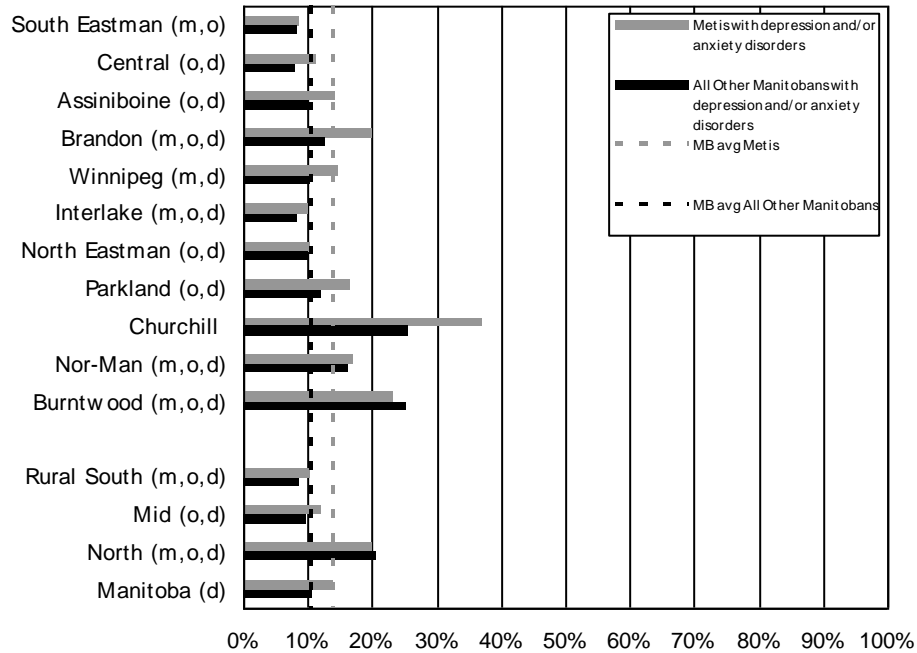
- Metis have a higher prevalence of substance abuse compared to All Other Manitobans in Fort Garry (11.5% vs. 6.6%), Assiniboine South (10.5% vs. 8.1%), St. Boniface (12.5% vs. 8.6%), St. Vital (10.9% vs. 8.2%), Transcona (11.2% vs. 7.7%), River Heights (15.7% vs. 9.6%), River East (14.6% vs. 8.7%), Seven Oaks (11.8% vs. 8.1%), St. James-Assiniboia (12.3% vs. 8.4%), Inkster (16.3% vs. 11.0%), Downtown (26.7% vs. 17.7%), and Point Douglas (19.6% vs. 17.7%) CAs
- Metis have a higher prevalence of substance abuse compared to their provincial average in River Heights (15.7% vs. 13.8%), River East (14.6% vs. 13.8%), Inkster (16.3% vs. 13.8%), Downtown (26.7% vs. 13.8%), and Point Douglas (19.6% vs. 13.8%) CAs whereas they have a lower prevalence of substance abuse compared to their provincial average in Assiniboine South (10.5% vs. 13.8%) CA
- All Other Manitobans have a higher prevalence of substance abuse compared to their provincial average in Inkster (11.0% vs. 10.5%), and Point Douglas (17.7% vs.

10.5%) CAs whereas they have a lower prevalence of substance abuse in Fort Garry (6.6% vs. 10.5%) and River Heights (9.6% vs. 10.5%) CAs

- There is no gradient for the prevalence of substance abuse in Metis but there is one for All Other Manitobans that increases from the most healthy to the least healthy CAs

Figure 4.4.1: Prevalence of Substance Abuse by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years

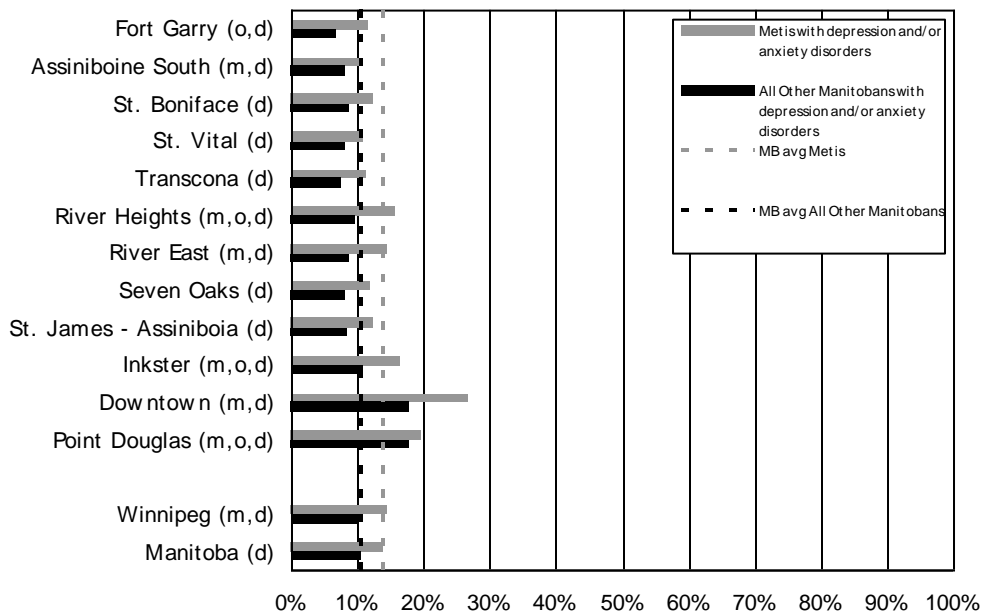


'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 4.4.2: Prevalence of Substance Abuse by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

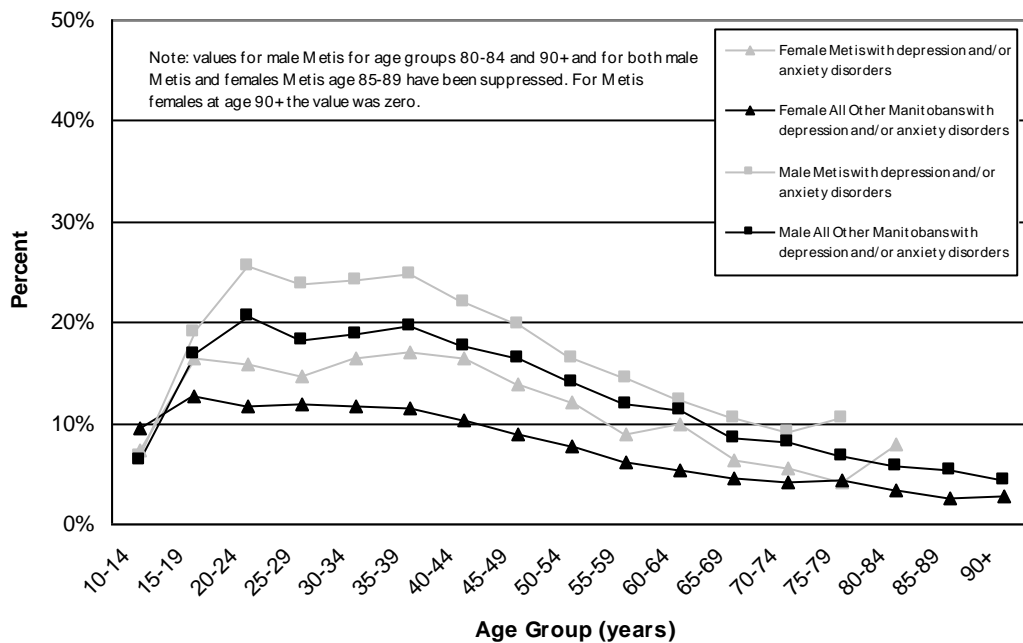
Age- and Sex-Specific:

Manitoba (Figure 4.4.3):

- Throughout most of their lives, Metis males and Metis females have a decreasing crude prevalence of substance abuse over age. The highest rates are seen in the young adult and mid-aged population
- Throughout most of their lives Metis males and Metis females have a higher crude prevalence of substance abuse compared to All Other Manitoban males and All Other Manitoban females, respectively
- Metis males have a higher crude prevalence of substance abuse compared to Metis females

Figure 4.4.3: Prevalence of Substance Abuse in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Crude percent of residents aged 10+ years



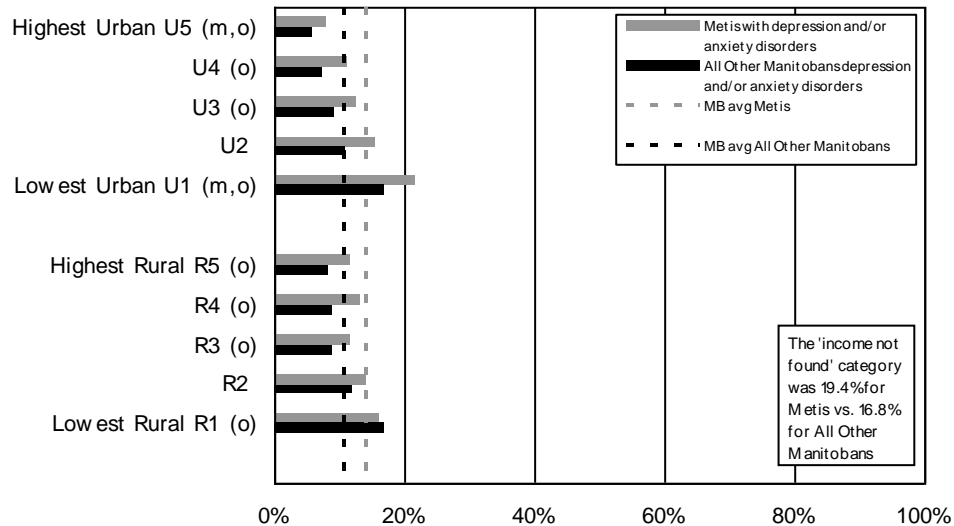
Source: MMF, 2013

Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 4.4.4):

- **Urban:** Metis have a higher prevalence of substance abuse compared to their provincial average in U1 (21.7% vs. 14.3%) whereas they have a lower prevalence of substance abuse compared to their provincial average in U5 (7.9% vs. 14.3%)
- All Other Manitobans have a higher prevalence of substance abuse compared to their provincial average in U1 (17.0% vs. 10.7%) whereas they have a lower prevalence of substance abuse compared to their provincial average in U5 (6.0% vs. 10.7%), U4 (7.5% vs. 10.7%), and U3 (9.1% vs. 10.7%)
- **Rural:** All Other Manitobans have a higher prevalence of substance abuse compared to their provincial average in R1 (17.0% vs. 10.7%) whereas they have a lower prevalence of substance abuse compared to their provincial average in R5 (8.4% vs. 10.7%), R4 (8.9% vs. 10.7%), and R3 (9.0% vs. 10.7%)
- **Income not found:** There was no difference between Metis and All Other Manitobans in Manitoba (19.4% vs. 16.8%)
- **Linear Trend Test:** For all urban and rural Metis as well as urban and rural All Other Manitobans, there is an increasing trend of prevalence of substance abuse from the highest to lowest neighborhood income quintiles.

Figure 4.4.4: Prevalence of Substance Abuse in Manitoba by Income Quintile for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07
Age- and sex-adjusted percent of residents aged 10+ years



'm' indicates the area rate for Metis with IHD was statistically different from the Manitoba average for Metis
'o' indicates the area rate for All Other Manitobans was statistically different from the Manitoba average for All Other Manitobans
'd' indicates the difference between the two groups' rates was statistically significant for this area
's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results
Urban Metis: Significant (p < 0.001) Urban All Other Manitobans: Significant (p < 0.001)
Rural Metis: Significant (p < 0.001) Rural All Other Manitobans: Significant (p < 0.001)

**Key observations:
Metis and All Other Manitobans**

Logistic regression (Table 4.4.1):

- Metis are at a greater risk of developing substance abuse compared to All Other Manitobans (aOR 1.27, 95% CI 1.23 - 1.32) after controlling for other factors
- Manitobans in North aggregate region have a higher risk of developing substance abuse compared to Manitobans living elsewhere (aOR 2.14, 95% CI 2.08 - 2.19) after controlling for other factors
- Manitobans with depression (aOR 3.23, 95% CI 3.16 - 3.30), anxiety disorders (aOR 1.57, 95% CI 1.52 - 1.61), schizophrenia (aOR 2.11, 95% CI 1.98 - 2.24), and personality disorders (aOR 3.16, 95% CI 3.00 - 3.33) have a higher risk of substance abuse, after controlling for other factors, than those who do not have any of these psychiatric conditions
- Risk of developing substance abuse increases with age (aOR 1.06, 95% CI 1.058 - 1.063) after controlling for other factors
- Males are at a greater risk of developing substance abuse compared to females in Manitoba (aOR 1.54, 95% CI 1.51 - 1.57) after controlling for other factors
- Metis with major physical illness have a higher risk of developing substance abuse compared to those without physical illness (aOR 1.53, 95% CI 1.50 - 1.57) after controlling for other factors

Table 4.4.1: Logistic Regression Modeling of the Possible Predictors of Substance Abuse, 2002/03-2006/07
Probability of Substance Abuse Diagnosis by Aggregate Region for Residents Aged 10+ years

Variable	Adjusted Odds Ratio (95% Confidence Interval)	p-value
Metis (vs. All Other Manitobans)	1.272 (1.228 – 1.317)	<0.001
Aggregate Regions (ref=Manitoba)		
South	0.660 (0.645 – 0.676)	<0.001
Mid	0.754 (0.736-0.773)	<0.001
North	2.137 (2.083 – 2.193)	<0.001
Brandon	1.018 (0.982 – 1.056)	0.319
Winnipeg	0.923 (0.908 – 0.938)	<0.001
Depression	3.231 (3.160 – 3.303)	<0.001
Anxiety Disorders	1.567 (1.524 – 1.610)	<0.001
Schizophrenia	2.106 (1.978 – 2.242)	<0.001
Personality Disorders	3.162 (2.999 – 3.334)	<0.001
Age, linear	1.060 (1.058 – 1.063)	<0.001
Age, quadratic	0.999 (0.999 – 0.999)	<0.001
Males (vs. Females)	1.538 (1.508 – 1.569)	<0.001
Average Household Income of Neighborhood (per \$10,000)	0.830 (0.825 – 0.834)	<0.001
Major Physical Illness ADGs	1.534 (1.501 – 1.567)	<0.001

Bold = statistically significant results

Note: Please see Glossary for definition of all variables.

Source: MMF, 2011

Findings from Literature Review

(Compared to the results in this study – *in italics*):

Comorbidity between substance abuse and depression and/or anxiety disorders is not uncommon (CPA, 2006a; Gratzner et al., 2004; Kessler et al., 1997). Results from major studies in both Canada and the United States indicated that individuals with either depression or anxiety disorders are two to four times more liable to develop alcohol and drug abuse than those without any of these conditions (Kessler et al., 2005; Lukassen & Beaudet, 2005; Regier et al., 1990). There is also evidence that rates of substance abuse are higher among individuals with comorbid depression and anxiety disorders compared to those with either depression or anxiety disorders alone (Gratzner et al., 2004; Kessler et al., 1997).

Information related to substance abuse in Metis is limited. In one survey in British Columbia, 19.7% of Metis respondents reported that they, or a family member, had used illegal drugs in the previous year (Hutchinson et al., 2007). In the Metis Atlas (Martens, Bartlett, et al., 2010), it was reported that the five-year prevalence of substance abuse was significantly higher in Metis compared to All Other Manitobans provincially (7.2% vs. 4.9%) and in Central (5.2% vs. 3.3%), Assiniboine (7.1% vs. 4.2%), Brandon (9.1% vs. 5.6%), Winnipeg (8.1% vs. 4.8%), Interlake (4.8% vs. 3.7%), and Parkland (6.7% vs. 4.6%) RHAs. Substance abuse in Metis was also significantly higher in every Winnipeg CA, with the highest prevalence in Downtown (14.5% vs. 8.0%) and Point Douglas (12.8% vs. 8.7%) CAs. The information in those studies is not limited to those with depression and/or anxiety disorders.

There is limited comparable information for Metis with depression and/or anxiety disorders and prevalence of substance abuse. The Metis Atlas also found that 18.0% of Metis diagnosed with an anxiety disorder and 15.6% of Metis diagnosed with depression also had a diagnosis of substance abuse (compared to 12.4% and 11.1% for All Other Manitobans, respectively) during the 5-year period of the study. In our study, Metis have a higher prevalence of substance abuse compared to All Other Manitobans provincially and in Rural South, and Mid aggregate areas. Among RHAs, Metis have a higher prevalence of substance abuse compared to all other Manitobans in all RHAs except South Eastman, Churchill and Burntwood RHAs as well as higher rates in every Winnipeg CA.

In the general Canadian population there is strong evidence that heavy drinking and illicit drug use increases from the late teens to early twenties and then drops significantly for subsequent age groups until age 65 years and older (Government of Canada, 2006; Lukassen & Beaudet, 2005; Tjepkema, 2004). A similar pattern is apparent for the general Manitoba population (Martens et al., 2004). As for people with comorbid depression, there may be no decrease in alcohol dependence with age at all (Gratzner et al., 2004; Kessler et al., 1997). Lukassen and Beaudet (2005) found no significant differences between age groups for individuals classified with comorbid depression-alcohol dependence after adjusting for other factors. In both Canada and the United States, results from national surveys indicate that the prevalence of substance abuse prevalence among men is approximately twice that of women in the general population. However, for individuals with depression or anxiety disorders, substance abuse is at least two times more common among women than men (Kessler et al., 1997; Lukassen & Beaudet, 2005).

There is no available age- or sex-specific information related to substance abuse for Metis individuals with mental disorders. In this study, Metis males and Metis females have a higher crude prevalence of substance

abuse throughout their lives compared to All Other Manitoban males and All Other Manitobans females, respectively.

For the general Canadian population, results from Cycles 1.1 and 1.2 of the CCHS indicate that individuals living in the lowest-income households had more than 1.5 times more susceptibility to alcohol dependence and 3.5 times susceptibility to drug dependence than those in the highest-income households, after adjusting for other factors (Lukassen & Beaudet, 2005; Tjepkema, 2004). This information, however, was not specific to individuals with depression and/or anxiety disorders.

There is no known information related to income and substance abuse for Metis. In our study, prevalence of substance abuse in urban and rural Metis increases as neighborhood level income decreases.

Prevalence of substance abuse is clearly an area of concern for Metis with depression and/or anxiety in Manitoba. Metis in virtually all the RHAs and every single Winnipeg Community Area have a higher prevalence of substance abuse compared to All Other Manitobans. In addition, the increasing substance abuse prevalence trends for both urban Metis and rural Metis as area-level neighborhood income quintiles decrease warrants further investigation as does higher rates of substance abuse among Metis men and Metis women compared with All Other Manitoban men and All Other Manitoban women.

4.5 Prevalence of Suicide Attempts or Completions

A suicide attempt is the deliberate act of an individual to end his or her own life. For this indicator, both the age- and sex-adjusted and the age- and sex-specific annual prevalence of individuals attempting or completing suicide was measured per 10,000 residents with depression and/or anxiety disorders aged 10 years and older for calendar years 1997-2006. Residents were considered to have attempted suicide if they met one of the following:

- a hospitalization with a diagnosis for suicide and self-inflicted injury (see the Glossary for specific ICD-9-CM and ICD-10-CA codes)
- a hospitalization with a diagnosis code for accidental poisoning if there was a physician visit with a diagnosis code for accidental poisoning and a psychiatric tariff code either during the hospital stay or within 30 days post-discharge (see the Glossary for relevant physician tariff codes)

Residents were considered to have completed suicide if a death record was present in Vital Statistics data with poisoning or self-inflicted injury noted as the primary cause of death (for specific ICD-9-CM and ICD-10-CA codes, please refer to the appended Glossary).

Accidental poisoning was included in the definition to avoid underestimation of the prevalence of suicide. The reason of this inclusion is that physicians or coders may be inclined to write down ‘accidental poisoning’ instead of ‘suicidal attempt’ if there is no conclusive evidence for a suicide attempt or to avoid social stigmatization of the patient. Inclusion of accidental poisoning patients was done only if the patient visited a psychiatrist or was hospitalized with mental illness diagnosis within 30 days of presenting with accidental poisoning since this could be a clue that poisoning was not accidental and might have been purposefully committed as a means of suicide. In the Metis Atlas, this percent accounted for less than 1% of the prevalence of annual attempts of suicide (Martens, & Bartlett et al. 2010).

The denominator includes the total number of each of Metis and All Other Manitoban populations with depression and/or anxiety disorders aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of attempted or completed suicides among Metis, the denominator is the total number of Metis population with depression and/or anxiety disorders aged 10+ years.

Note: There is no age- and sex- specific graph included in this sub-section, as the data lacked statistical validity due to small numbers of observed cases in many of the RHAs and Winnipeg CAs. Prevalence rate of suicide attempts and completions was presented per 10,000 residents.

Key observations:

Metis and All Other Manitobans with depression and/or anxiety disorders

Manitoba (Figure 4.5.1):

- There is no difference in prevalence of attempted or completed suicides between Metis and All Other Manitobans in Manitoba (29.9 vs. 20.5 per 10,000 residents)

Aggregate areas (Figure 4.5.1):

- There is no difference in prevalence of attempted or completed suicides between Metis and All Other Manitobans at the aggregate level
- Metis have a higher prevalence of attempted or completed suicides than their provincial average in North aggregate area (57.4 vs. 29.9 per 10,000 residents)
- All Other Manitobans have a higher prevalence of attempted or completed suicides than their provincial average in North aggregate area (66.2 vs. 20.5 per 10,000 residents)
- There is a gradient for prevalence of attempted or completed suicides in Metis and All Other Manitobans that is increasing from the most healthy to the least healthy aggregate areas as ordered by PMR

RHAs (Figure 4.5.1):

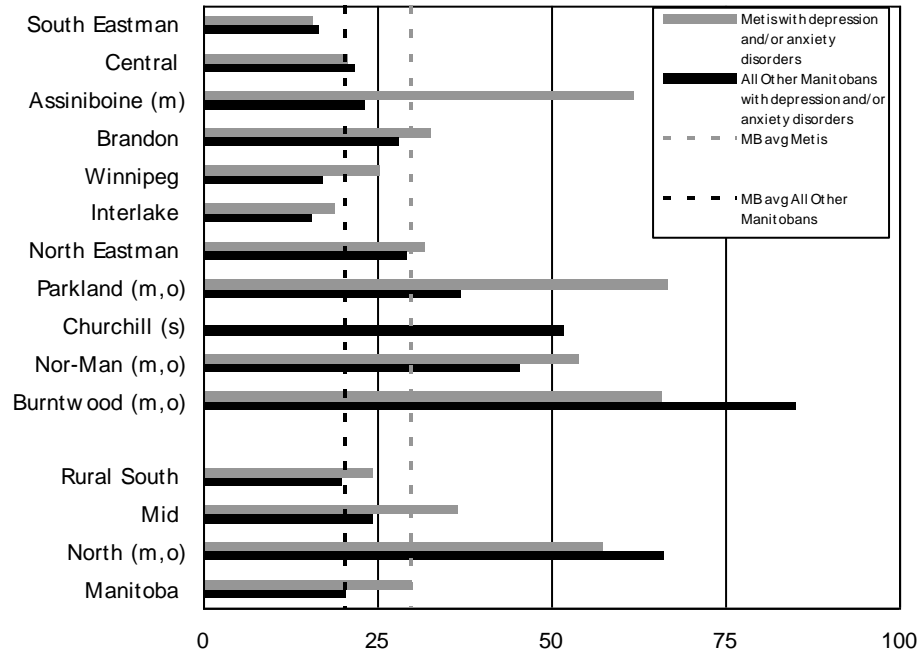
- There is no difference in prevalence of attempted or completed suicides between Metis and All Other Manitobans at the RHA level
- Metis have a higher prevalence of attempted or completed suicides than their provincial average in Assiniboine (61.9 vs. 29.9 per 10,000 residents), Parkland (67.7 vs. 29.9), Nor-Man (54.0 vs. 29.9), and Burntwood (65.9 vs. 29.9) RHAs
- All Other Manitobans have a higher prevalence of attempted or completed suicides than their provincial average in Parkland (37.2 vs. 20.5 per 10,000 residents), Nor-Man (45.5 vs. 20.5), and Burntwood (85.1 vs. 20.5) RHAs
- There is no gradient for the prevalence of attempted or completed suicides neither in Metis nor in All Other Manitobans at the RHA level

Winnipeg CAs (Figure 4.5.2):

- There is no difference in prevalence of attempted or completed suicides between Metis and All Other Manitobans at the CA level
- All Other Manitobans have a lower prevalence of attempted or completed suicides than their provincial average in St. Vital (13.9 vs. 20.5 per 10,000 residents), Transcona (12.2 vs. 20.5), and Seven Oaks (12.0 vs. 20.5) CAs
- There is no gradient for the prevalence of attempted or completed suicides neither in Metis nor in All Other Manitobans from the most healthy to the least healthy CAs

Figure 4.5.1: Prevalence of Attempted or Completed Suicides by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 1997-2006

Age- and sex-adjusted prevalence per 10,000 residents aged 10+ years

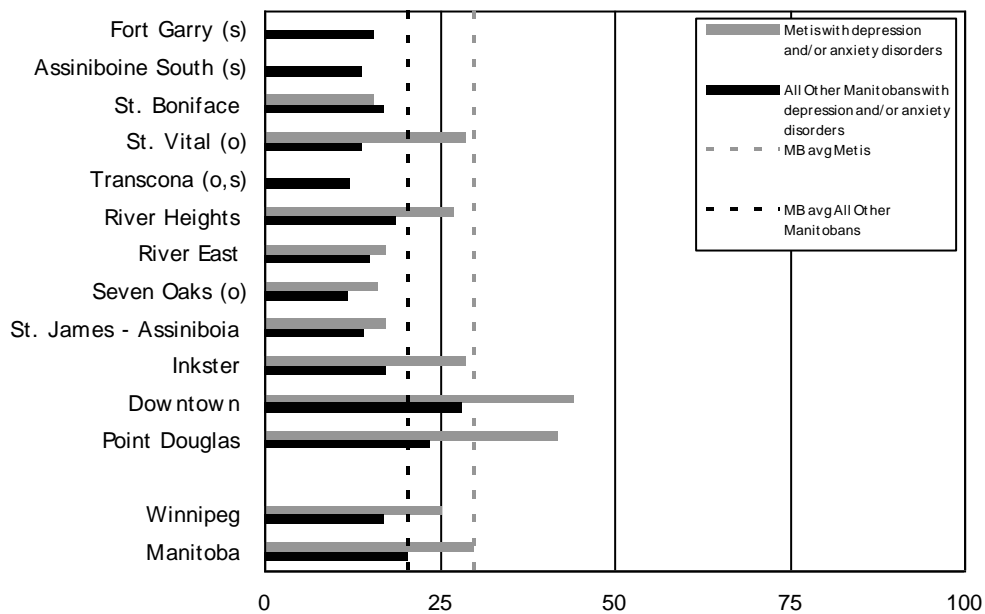


'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 4.5.2: Prevalence of Attempted or Completed Suicides by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 1997-2006

Age- and sex-adjusted prevalence per 10,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

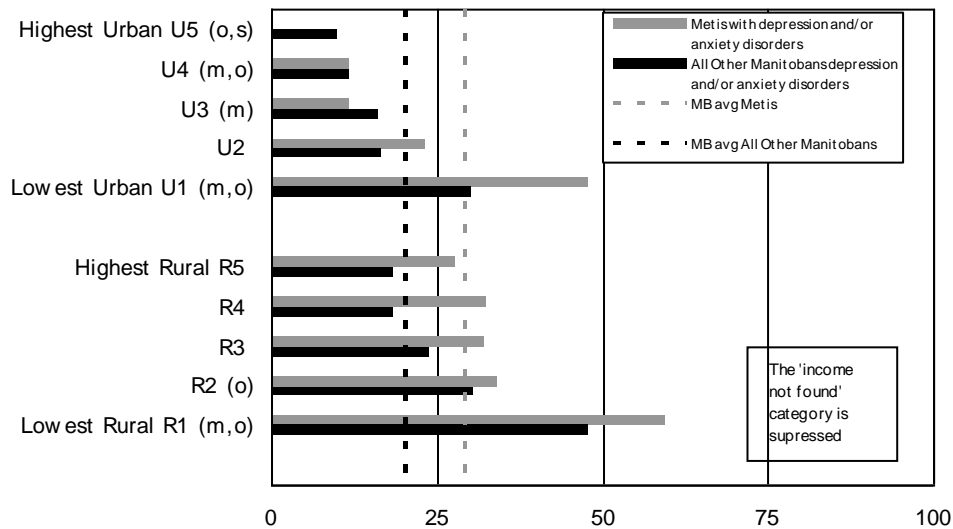
Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 4.5.3):

- **Urban:** Metis have a higher prevalence of attempted or completed suicides compared to their provincial average in U1 (47.7 vs. 29.2 per 10,000 residents) whereas they have a lower prevalence of attempted or completed suicides compared to their provincial average in U4 (11.9 vs. 29.2), and U3 (11.9 vs. 29.2)
- All Other Manitobans have a higher prevalence of attempted or completed suicides compared to their provincial average in U1 (30.3 vs. 20.2 per 10,000 residents) whereas they have a lower prevalence of attempted or completed suicides compared to their provincial average in U5 (9.9 vs. 20.2), and U4 (11.9 vs. 20.2)
- **Rural:** Metis have a higher prevalence of attempted or completed suicides compared to their provincial average in R1 (59.6 vs. 29.2 per 10,000 residents)
- All Other Manitobans have a higher prevalence of attempted or completed suicides compared to their provincial average in R2 (30.4 vs. 20.2 per 10,000 residents), and R1 (47.6 vs. 20.2)
- **Linear trend test:** There is no trend for urban Metis and urban All Other Manitobans in Manitoba. Rural Metis and rural All Other Manitobans, however, demonstrate an increasing trend of prevalence of attempted or completed suicides as the income quintiles decrease

Figure 4.5.3: Prevalence of Attempted or Completed Suicides by Income Quintile for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 1997-2006

Age- and sex-adjusted prevalence per 10,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
'd' indicates the difference between the two groups' rates was statistically significant for this area
's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results

Urban Metis: Not Significant Urban All Other Manitobans: Not Significant
Rural Metis: Significant (p < 0.001) Rural All Other Manitobans: Significant (p < 0.001)

**Key observations:
Metis and All Other Manitobans****Logistic regression (Table 4.5.1):**

- Metis have almost the same likelihood as All Other Manitobans to attempt or complete suicide.
- Manitobans in North aggregate region have a higher risk of suicide attempts or completions compared to Manitobans living elsewhere (aOR 2.55, 95% CI 2.36 - 2.76), after controlling for other factors
- Manitobans with depression (aOR 6.61, 95% CI 6.05 - 7.22), anxiety disorders (aOR 1.41, 95% CI 1.29 - 1.53), substance abuse (aOR 5.42, 95% CI 5.01- 5.85), schizophrenia (aOR 1.78, 95% CI 1.54 - 2.05), and personality disorders (aOR 5.84, 95% CI 5.28- 6.46) have a higher risk of suicide attempts or completions compared to Manitobans without any of these conditions, after controlling for other factors
- Manitobans with a major physical illness have a 1.39 times the risk of suicide attempts or completions compared to Manitobans without major physical illness (aOR 1.39, 95% CI 1.29 - 1.50), after controlling for other factors

Table 4.5.1: Logistic Regression Modeling for the Possible Predictors of Suicide Attempts or Completed Suicides, 2002/03-2006/07

Probability of Suicide Attempts or Completions by Aggregate Region for Residents Aged 10+ years

Covariates	Adjusted Odds Ratio (95% Confidence Interval)	p-value
Metis (vs. All Other Manitobans)	0.958 (0.846-1.084)	0.494
Aggregate Regions (ref=Manitoba)		
South	0.778 (0.718 – 0.844)	< 0.001
Mid	1.056 (0.976 – 1.143)	0.176
North	2.550 (2.360 – 2.756)	<0.001
Brandon	0.802 (0.705 – 0.913)	<0.001
Winnipeg	0.595 (0.560 – 0.632)	<0.001
Depression	6.606 (6.046 – 7.219)	<0.001
Anxiety Disorders	1.405 (1.294 – 1.526)	<0.001
Substance Abuse	5.416 (5.012 – 5.853)	<0.001
Schizophrenia	1.775 (1.539 – 2.048)	<0.001
Personality Disorders	5.841 (5.279 – 6.462)	<0.001
Age, linear	0.969 (0.961-0.977)	<0.001
Age, quadratic	0.999 (0.999 – 0.999)	0.154
Males (vs. Females)	0.922 (0.859 – 0.990)	0.0257
Average Household Income of Neighborhood (per \$10,000)	0.842 (0.824 – 0.861)	<0.001
Major Physical Illness ADGs	1.393 (1.293 – 1.502)	<0.001

Bold = statistically significant results

Note: Please see Glossary for definition of all variables.

Source: MMF, 2013

Findings from Literature Review

(Compared to the results in this study – *in italics*):

With the limitations related to measuring suicidal attempts or completions in mind (see subsection 1.11), the age-standardized suicide rate for Canadians aged 10 years and older in 1998 was 13.2 per 100,000 (Langlois & Morrison, 2002). That study also estimated a crude hospitalization rate for suicide attempts in 1998/99 of 87 per 100,000 Canadians aged 10 years and older; however, repeated attempts by the same individuals accounted for approximately 13% of these hospitalizations. Despite some differences in measurement criteria, the Manitoba rates for a similar time period (1997-2001) appear quite similar (Martens et al., 2004).

It has consistently been found that individuals diagnosed with mental disorders have a strongly increased risk of suicide (Conwell et al., 1996; Harris & Barraclough, 1998). Reviews of the relevant literature indicate a clear association in the general population between depression and suicide attempts (Beautrais et al., 1996; Nock & Kessler, 2006) and suicide completions (Conwell et al., 1996; Harris & Barraclough, 1998; Wulsin, Vaillant, & Wells, 1999). Risk of suicide completions is 20 times higher for those with major depression and close to 12 times higher for conditions such as bipolar disorders compared to the general population (Harris & Barraclough, 1998). However, it is important to note that less than 1% of individuals with depression will actually commit suicide (Wulsin et al., 1999).

Information related to suicide completions or attempts in the Metis population specifically is limited. Results from the 2002 Canadian Community Health Survey do indicate, however, that Métis women were more likely to have considered or attempted suicide compared to Canadian women overall (Women of the Métis Nation, 2007). Martens, Bartlett, et al. (2010) found that while Metis aged 10 years and older were no more likely than All Other Manitobans to complete suicide in Manitoba (0.17 vs. 0.15 per 1,000), they were more likely to do so in Winnipeg (0.21 vs. 0.19). Metis were significantly more likely to have completed or attempted suicide in Manitoba (0.11% vs. 0.08%), in Assiniboine (0.17% vs. 0.08%), Winnipeg (0.10% vs. 0.06%), and Parkland (0.20% vs. 0.12%) RHAs, and in St. Vital (0.11% vs. 0.04%), River Heights (0.12% vs. 0.06%), Inkster (0.12% vs. 0.06%), Downtown (0.19% vs. 0.12%), and Point Douglas (0.18% vs. 0.11%) CAs.

Suicide attempts and completions are strongly influenced by socioeconomic deprivation in the general population (Gunnel, Peters, Kammerling, & Brooks, 1995). In Manitoba, prevalence rates for suicide completions and attempts in both urban and rural areas increase from the highest to the lowest income quintiles, with the largest increase between the second-lowest and lowest quintiles (Martens, Brownell, et al., 2010). The association between suicide and income appears similar for individuals with depression. Bolton, Belik, Enns, Cox, and Sareen (2008) found that the suicide attempts by individuals with major depressive disorders decreased with every increase in the income group. There is no known literature concerning the influence of income on suicide completions and attempts in the Metis population.

Globally, males complete suicide more often than females, while females attempt suicide more often than males (Mościcki, 1988). Canadian data show a similar trend; three-quarters of suicides between 2003 and 2007 were carried out by males (Statistics Canada, 2010), but females were hospitalized for suicide attempts approximately 1.5 times more often than males (Langlois & Morrison, 2002). Statistics Canada (2010) data for 2003-2007 indicates

that males commit suicide approximately three times as often as females until age 69, and four to six times more in the 70+ year age range. For suicide-attempt hospitalizations, women outnumber men significantly in Canada until age 59, and then they become similar to men until age 74, and are slightly outnumbered by men in the 75+-age category (Langlois & Morrison, 2002). Despite some differences in measurement criteria, Manitoba rates appear to follow a similar pattern (Martens et al., 2004).

Age- and sex-specific suicide information related to Metis is limited, though there are indications that suicide completions and attempts for this group reflect sex patterns for the general Canadian population. A recent study found that suicide rates in Métis women were similar to those of non-Aboriginal women (rate ratio [RR] 0.85, 95% CI 0.27-2.64) and rates for Métis men were significantly higher than those of non-Aboriginal men (RR 1.60, 95% CI 1.03-2.50). These results suggest an even more pronounced male-female ratio for suicide in Métis than in the non-Aboriginal population (Tjepkema, Wilkins, Sénécal, Guimond, & Penney, 2009).

There are no comparative studies examining the prevalence of suicide attempts or deaths specifically amongst those with depression and/or anxiety disorders. In this study, Metis do not have a higher prevalence of suicide attempts or completed suicides at the provincial level (29.9 vs. 20.5 per 10,000 people). Similarly, there are no differences at the aggregate, RHA, and Winnipeg CAs levels. Urban Metis have an increasing trend in prevalence of suicide attempts or completions from the highest to the lowest neighborhood income quintile.

There is no difference in prevalence of suicide attempts or deaths between Metis and All Other Manitobans at the provincial level. However further investigation is warranted regarding the effects of income level on prevalence of attempted or completed suicides in Metis individuals.

References

- Axelson, D. A., & Birmaher, B. (2001). Relation between anxiety and depressive disorders in childhood and adolescence. *Depression and Anxiety, 14*(2), 67-78.
- Beautrais, A. L., Joyce, P. R., Mulder, R. T., Fergusson, D. M., Deavoll, B. J., & Nightingale, S. K. (1996). Prevalence and comorbidity of mental disorders in persons making serious suicide attempts: A case-control study. *American Journal of Psychiatry, 153*(8), 1009-1014.
- Blair-West, G. W., Cantor, C. H., Mellsop, G. W., & Eyeson-Annan, M. L. (1999). Lifetime suicide risk in major depression: Sex and age determinants. *Journal of Affective Disorders, 55*(2-3), 171-178.
- Bolton, J. M., Belik, S.-L., Enns, M. W., Cox, B. J., & Sareen, J. (2008). Exploring the correlates of suicide attempts among individuals with major depressive disorder: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry, 69*(7), 1139-1149.
- British Columbia Provincial Health Officers. (2009). *Pathways to health and healing: Second report on the health and well-being of Aboriginal people in British Columbia. Provincial Health Officer's Annual Report 2007*. Vancouver, BC: Ministry of Healthy Living and Sport.
- Cairney, J., Corna, L. M., Veldhuizen, S., Herrmann, N., & Streiner, D. L. (2008). Comorbid depression and anxiety in later life: Patterns of association, subjective well-being, and impairment. *American Journal of Geriatric Psychiatry, 16*(3), 201-208.
- Canadian Psychiatric Association. (2006a). Clinical practice guidelines for the management of anxiety disorders: 2. Principles of diagnosis and management of anxiety disorders. *Canadian Journal of Psychiatry, 51*(Suppl. 2), 7S-8S.
- Canadian Psychiatric Association. (2006b). Clinical practice guidelines for the management of anxiety disorders: 9. Special populations. *Canadian Journal of Psychiatry, 51*(Suppl. 2), 65S-69S.
- Conwell, Y., Duberstein, P. R., Cox, C., Herrmann, J. H., Forbes, N. T., & Caine, E. D. (1996). Relationships of age and axis I diagnoses in victims of completed suicide: A psychological autopsy study. *American Journal of Psychiatry, 153*(8), 1001-1008.
- Government of Canada. (2006). *The human face of mental health and mental illness in Canada, 2006*. Ottawa, ON: Minister of Public Works and Government Services Canada.
- Gratzer, D., Levitan, R. D., Sheldon, T., Toneatto, T., Rector, N. A., & Goering, P. (2004). Lifetime rates of alcoholism in adults with anxiety, depression, or co-morbid depression and/or anxiety: A community survey of Ontario. *Journal of Affective Disorders, 79*(1-3), 209-215.
- Gunnell, D. J., Peters, T. J., Kammerling, R. M., & Brooks, J. (1995). Relation between parasuicide, suicide, psychiatric admissions, and socioeconomic deprivation. *British Medical Journal 311*(6999), 226-230.
- Harris, E. C., & Barraclough, B. (1998). Suicide as an outcome for mental disorders: A meta-analysis. *British Journal of Psychiatry, 170*(3), 205-228.

- Health Officers Council of British Columbia. (2005). *A public health approach to drug control in Canada: Discussion paper*. Retrieved from http://www.keepingthedooropen.com/Portals/0/hoc_paper_media_backgrounder.pdf
- Hirschfeld, R. M. A. (2001). The comorbidity of major depression and anxiety disorders: Recognition and management in primary care. *Journal of Clinical Psychiatry*, 3(6), 244-254.
- Hutchinson, P., Evans, M., & Reid, C. (2007). *Report on the statistical description and analysis of the 2006 Métis Nation of British Columbia Provincial Survey*. Retrieved from http://www.mpcbc.bc.ca/health/pdf/mnbc_survey_results.pdf
- Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., ... & Kendler, K. S. (1994). Lifetime and 12-month prevalence of *DSM-III-R* psychiatric disorders in the United States. *Archives of General Psychiatry*, 51(1), 8-19.
- Kessler, R. C., Crum, R. M., Warner, L. A., Nelson, C. B., Schulenberg, J., & Anthony, J. C. (1997). Lifetime co-occurrence of *DSM-III-R* alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. *Archives of General Psychiatry*, 54(4), 313-321.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K. R., ... Wang, P. S. (2003). The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication (NCS-R). *Journal of the American Medical Association*, 289(23), 3095-3105.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of *DSM-IV* disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62(6), 593-603.
- Kessler, R. C., Birnbaum, H. G., Shahly, V., Bromet, E., Hwang, I., McLaughlin, K. A., ... Stein, D. J. (2010). Age differences in the prevalence and co-morbidity of *DSM-IV* major depressive episodes: Results from the WHO World Mental Health Survey Initiative. *Depression and Anxiety*, 27(4), 351-364.
- Ksir, O., & Ray, C. (Eds.). (2002). *Drugs, society, and human behavior*. Boston MA: McGraw-Hill.
- Langlois, S., & Morrison, P. (2002). Suicide deaths and attempts. *Health Reports*, 13(2), 9-22.
- Lemstra, M., Neudorf, C., Mackenbach, J., D'Arcy, C., Scott, C., Kershaw, T., & Nannapaneni, U. (2008). Risk indicators for depressed mood in youth: Limited association with Aboriginal cultural status. *Pediatrics & Child Health*, 13(4), 285-290.
- Lorant, V., Deliège, D., Eaton, W., Robert, A., Philippot, P., & Anseau, M. (2003). Socioeconomic inequalities in depression: A meta-analysis. *American Journal of Epidemiology*, 157(2), 98-112.
- Lukassen, J., & Beaudet, M. P. (2005). Alcohol dependence and depression among heavy drinkers in Canada. *Social Science & Medicine*, 61(8), 1658-1667.
- Manitoba Centre for Health Policy. (2008). *Anxiety disorders* (glossary definition). Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=103879>
- Manitoba Centre for Health Policy. (2010). *Depression* (glossary definition). Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=102544>

- Manitoba and Manitoba Metis Federation Policy Committee. (2010). *From the past into the future: Manitoba Métis Policy*. Winnipeg, MB: Government of Manitoba and Manitoba Metis Federation.
- Martens, P.J., Bartlett, J., Burland, E., Prior, H., Burchill, C., Huq, S., Romphf, L., Sanguins, J., Carter, S., & Bailly, A. (2010). *Profile of Metis health status and healthcare utilization in Manitoba: A population-based study*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Martens, P., Fransoo, R., McKeen, N., The Need to Know Team, Burland, E., Jebemani, L., ... & Metge, C. (2004). *Patterns of regional mental illness disorder diagnoses and service use in Manitoba: A population-based study*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Martin-Merino, E., Ruigómez, A., Johansson, S., Wallander, M.A., & García-Rodríguez, L.A. (2010). Study of a Cohort of Patients Newly Diagnosed With Depression in General Practice: Prevalence, Incidence, Comorbidity, and Treatment Patterns. *Primary Care Companion Journal of Clinical Psychiatry*, 12(1), 1-8.
- Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology*, 49, 377-412.
- Mościcki, E. K., O'Carroll, P., Rae, D. S., Locke, B. Z., Roy, A., & Regier, D. A. (1988). Suicide attempts in the Epidemiologic Catchment Area Study. *Yale Journal of Biology and Medicine*, 61(3), 259-268.
- Nock, M. K., & Kessler, R. C. (2006). Prevalence of and risk factors for suicide attempts versus suicide gestures: Analysis of the National Comorbidity Survey. *Journal of Abnormal Psychology*, 115(3), 616-623.
- Normand, J. (1996). *A profile of the Métis*. Ottawa, ON: Statistics Canada.
- Parikh, S. V., Lam, R. W., & the Canadian Network for Mood and Anxiety Treatment (CANMAT) Depression Working Group. (2001). Clinical guidelines for the treatment of depressive disorders: Definitions, prevalence, and health burden. *Canadian Journal of Psychiatry*, 46(Suppl. 1), 13S-20S.
- Patten, S. B. (2002). Progress against major depression in Canada. *Canadian Journal of Psychiatry*, 47(8), 775-780.
- Patten, S. B., Wang, J. L., Beck, C. A., & Maxwell, C. J. (2005). Measurement issues related to the evaluation and monitoring of major depression prevalence in Canada. *Chronic Diseases in Canada*, 26(4), 100-106.
- Patten, S., & Juby, H. (2008). *A profile of clinical depression in Canada*. Canadian Research Data Centre Network Synthesis Series: #1. Retrieved from https://dspace.ucalgary.ca/bitstream/1880/46327/6/Patten_RSS1.pdf
- Prina, A.M., Ferri, C.P., Guerra, M., Brayne, C., & Prince, M. (2011). Prevalence of anxiety and its correlates among older adults in Latin America, India and China: cross-cultural study. *British Journal of Psychiatry*, 199(6): 485-91.
- Regier, D. A., Farmer, M. E., Rae, D. S., Locke, B. Z., Keith, S. J., Judd, L. L., & Goodwin, F. K. (1990). Comorbidity of mental disorders with alcohol and other drug abuse: Results from the

- Epidemiologic Catchment Area (ECA) study. *Journal of the American Medical Association*, 264(19), 2511-2518.
- Sartorius, N., Lecrubier, Y., Utsun, T.B., et al. (1996). Depression comorbid with anxiety: results from the WHO study on psychological disorders in primary health care. *British Journal of Psychiatry*, 9: 38-43.
- Somers, J. M., Goldner, E. M., Waraich, P., & Hsu, L. (2006). Prevalence and incidence studies of anxiety disorders: A systematic review of the literature. *Canadian Journal of Psychiatry*, 51(2), 100-113.
- Statistics Canada. (1999). Psychological health – Depression. *Health Reports*, 11(3), 63-75.
- Statistics Canada. (2010). *Suicides and suicide rate, by sex and by age group*. Retrieved from <http://www40.statcan.ca/101/cst01/hlth66a-eng.htm>
- Sturm, R., & Gresenz, C. R. (2002). Relations of income inequality and family income to chronic medical conditions and mental health disorders: National survey in USA. *British Medical Journal*, 324(7328), 20-23.
- Thorpe, L., Whitney, D. K., Kutcher, S. P., Kennedy, S. H., & the CANMAT Depression Work Group. (2001). Clinical guidelines for the treatment of depressive disorders: VI. Special populations. *Canadian Journal of Psychiatry*, 46(Suppl. 1), 63S-76S).
- Tjepkema, M. (2004). Alcohol and illicit drug dependence. *Health Reports*, 15(1), 9-38.
- Tjepkema, M., Wilkins, R., Senécal, S., Guimond, É., & Penney, C. (2009). Mortality of Métis and Registered Indian adults in Canada: An 11-year follow-up study. *Health Reports*, 20(4), 31-51.
- United Way Winnipeg. (2010). *Eagle's eye view: An environmental scan of the Aboriginal community in Winnipeg* (2nd ed.). Winnipeg, MB: United Way Winnipeg.
- Waraich, P., Goldner, E. M., Somers, J. M., & Hsu, L. (2004). Prevalence and incidence studies of mood disorders: A systematic review of the literature. *Canadian Journal of Psychiatry*, 49(2), 124-138.
- Women of the Métis Nation. (2007). *Women of the Métis nation: Health policy paper*. Ottawa, ON: Métis Centre of the National Aboriginal Health Organization. Retrieved from <http://www.naho.ca/metiscentre/english/pdfs/womenMetisNation.pdf>
- World Health Organization. (2004). *Prevention of mental disorders: Effective interventions and policy implications*. Geneva, Switzerland: World Health Organization.
- World Health Organization. (2008). *The global burden of disease: 2004 update*. Geneva, Switzerland: World Health Organization.
- Wulsin, L. R., Vaillant, G. E., & Wells, V. E. (1999). A systematic review of the mortality of depression. *Psychosomatic Medicine*, 61(1), 6-17.

Section 5: Health Services Use

This section discusses the use of health services by individuals with depression and/or anxiety disorders. Individuals with either of these conditions have demonstrated significantly elevated rates of health services use than those without (Canadian Psychiatric Association [CPA], 2006; Parikh, Lam, & the CANMAT Depression Working Group, 2001). A recent study indicates that rates may be higher for those with comorbid depression-anxiety compared to those with either condition alone (Hämäläinen, Isometsä, Sihvo, Pirkola, & Kiviruusu, 2008). One study estimated that of high utilizers (the top 10% of users of health care services), 23.5% had major depression, 16.8% had dysthymia, and 21.8% had generalized anxiety disorder. A lifetime history of major depression was present in two-thirds of high utilizers (Katon et al., 1990). Approximately 50% of individuals with very high rates of health services use have untreated depression (Katzelnick et al., 2000). Clearly, the direct and indirect burden of depression and anxiety disorders on the general population is considerable. Until the release of this report, information about the use of health services by Metis with depression and/or anxiety disorders was unavailable. This study is an important step towards filling that information gap.

In each of the graphs in this section, the Regional Health Authorities are ordered by the ten-year premature mortality rate (PMR). Manitoba health regions are ordered from the most healthy to the least healthy according to their PMR. More information on ten-year PMR is provided in Section 1.

For each sub-section in this study, you will find an income quintile graph. Income quintile graphs show the prevalence of disease based on socioeconomic differences within the population (please see section 1.5.2: Making sense of the Graphs for further information).

The Manitoba Centre for Health Policy developed all indicator criteria used in this chapter for the Metis Atlas (Martens, Bartlett, et al., 2010) unless otherwise noted. In this section, each indicator for Metis with depression and/or anxiety disorders is compared to All Other Manitobans with depression and/or anxiety disorders. As noted in Section 1, the phrase ‘Metis and All Other Manitobans with depression and/or anxiety disorders’ refers to Metis with depression and/or anxiety disorders and All Other Manitobans with depression and/or anxiety disorders’. Also as noted in that section, unless otherwise indicated any mention of ‘lower’ or ‘higher’ refers to statistically significant results.

Indicators in this section include:

- All-cause ambulatory visit rate
- Ambulatory visits by cause of illness
- Ambulatory visit rate due to depression and/or anxiety disorders
- Psychiatrist visits due to depression and/or anxiety disorders
- All-cause hospital separation rate
- Hospital separations by cause of illness
- Hospital separation rate due to depression and/or anxiety disorders
- Antidepressant use

Overall Key Findings (Table 5.0):

- All-cause ambulatory visit rate (8.0 vs. 7.6 visits per resident per year), ambulatory visit rate for depression and/or anxiety disorders (1253.2 vs. 1417.8 per 1,000 residents per year), psychiatrist visits due to depression and/or anxiety disorders (193.7 vs. 260.6 per 1,000 residents per year), total hospital separation rate (331.3 vs. 268.9 per 1,000 residents) and antidepressant use (29.4% vs. 30.1%) showed no difference between Metis and All Other Manitobans in Manitoba
- Metis have a higher hospital separation rate for depression and/or anxiety (56.8 vs. 42.9 per 1,000) compared to All Other Manitobans in Manitoba

Table 5.0: Overall Key Findings of Health Services Use Indicators

Indicator (for individuals aged 10+ years)	Provincial difference between Metis and All Other Manitobans (age- and sex-adjusted unless otherwise stated), with RR (relative risk) for Metis	Statistically higher regions for Metis with depression and/or anxiety compared to provincial average for Metis with depression and/or anxiety*	Statistically lower regions for Metis with depression and/or anxiety compared to provincial average for Metis with depression and/or anxiety*
All-Cause Ambulatory Visit Rate	8.0 vs. 7.6 visits per person RR = 1.05, NS	Brandon RHA, Downtown Winnipeg CA, and Point Douglas Winnipeg CA	Interlake RHA, and Churchill RHA
Ambulatory Visit Rate for depression and/or anxiety disorders	1253.2 vs. 1417.8 visits per 1,000 person RR = 0.88, NS	Assiniboine South Winnipeg CA, St. Vital Winnipeg CA, River Heights Winnipeg CA, and Downtown Winnipeg CA	Rural South aggregate area, Mid aggregate area, Central RHA, Parkland RHA, and Burntwood RHA
Psychiatrist Visits for depression and/or anxiety disorders	193.7 vs. 260.6 visits per 1,000 person RR = 0.74, NS	Winnipeg RHA, Assiniboine South Winnipeg CA, St. Vital Winnipeg CA, River Heights Winnipeg CA, St. James-Assiniboia Winnipeg CA, and Point Douglas Winnipeg CA	Rural South aggregate area, Mid aggregate area, North aggregate area, Central RHA, North Eastman RHA, Parkland RHA, Churchill RHA, Nor-Man RHA, and Burntwood RHA
Total Hospital Separation Rate	331.3 vs. 268.9 per 1,000 residents RR = 1.23, NS	North aggregate area, Parkland RHA, Churchill RHA, and Burntwood RHA	Assiniboine South Winnipeg CA, St. Boniface Winnipeg CA, St. and James- Assiniboia CA
Hospital Separation Rate for depression and/or anxiety disorders	56.8 vs. 42.9 per 1,000 residents RR = 1.32, Significant	North aggregate area, Mid aggregate area, Central RHA, Assiniboine RHA, Parkland RHA, Churchill RHA, Nor-Man RHA, and Burntwood RHA	South Eastman RHA, Winnipeg RHA, North Eastman RHA, Assiniboine South Winnipeg CA, St. Boniface Winnipeg CA, St. Vital Winnipeg CA, Transcona Winnipeg CA, St. James – Assiniboia Winnipeg CA, Inkster Winnipeg CA, and Point Douglas Winnipeg CA
Antidepressant Use	29.4% vs. 30.1% RR = 0.98, NS	None	North aggregate area

NS = Not statistically different between Metis and All Other Manitobans

*This table is somewhat different from ‘overall key findings’ tables in other sections due to the need for careful interpretation of the context. Rather than state which regions are ‘worse’ or ‘better’ off, this table states which regions are lower or higher. While Metis in one region may have lower hospital separations, this must be examined together with other indicators for Metis regional health to see if this lower rate is appropriate given health status (Martens, Bartlett, et al., 2010)

5.1 All-Cause Ambulatory Visits

All-cause ambulatory visit rate includes almost all contacts with physicians (General Practitioners/Family Practitioners [GPs/FPs] and specialists): office visits, walk-in clinic visits, home visits, personal care home (nursing home) visits, visits to outpatient departments and some emergency room visits (when data is recorded). Excluded are services provided to patients while admitted to hospital and visits for prenatal care.

The age- and sex-adjusted and the age- and sex-specific annual ambulatory visit rates per resident were measured for five fiscal years: 2002/03-2006/07. The denominator includes the total number of each of Metis and All Other Manitoban populations with depression and/or anxiety disorders aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of all causes- ambulatory visit rates among Metis, the denominator is the total number of Metis population with depression and/or anxiety disorders aged 10+ years. There is a possibility that there is missing data for ambulatory visits because of an inability to pick up nursing station visits, especially in First Nations communities. Although nurse practitioners and salaried physicians are expected to 'shadow bill', incomplete billings can result in visits to these professionals being undercounted.

The pie charts included here indicate the most common causes of ambulatory visits for Metis and All Other Manitobans with depression and/or anxiety disorders. Information for the pie charts is based on crude rates, not adjusted rates. In these charts, visits related to pregnancy are not included.

Key observations:

Metis and All Other Manitobans with depression and/or anxiety disorders

Manitoba (Figure 5.1.1):

- Metis and All Other Manitobans have a similar ambulatory visit rate in Manitoba (8.0 vs. 7.6 visits per resident)

Aggregate areas (Figure 5.1.1):

- There is no difference in the ambulatory visit rate for all causes of illness between Metis and All Other Manitobans at the aggregate area level
- All Other Manitobans have a lower ambulatory visit rate for all causes of illness compared to their provincial average in Rural South aggregate area (6.8 vs. 7.6 visits)
- There is no gradient in the ambulatory visit rate for all causes of illness in Metis and All Other Manitobans in the aggregate areas as ordered by the PMR

RHAs (Figure 5.1.1):

- There is no difference in ambulatory visit rate for all causes of illness between Metis and All Other Manitobans at the RHA level
- Metis have a higher all-cause ambulatory visit rate compared to their provincial average in Brandon RHA (10.0 vs. 8.0 visits). However, they have a lower ambulatory visit rate than their provincial average in Interlake (6.9 vs. 8.0), and Churchill (5.8 vs. 8.0) RHAs

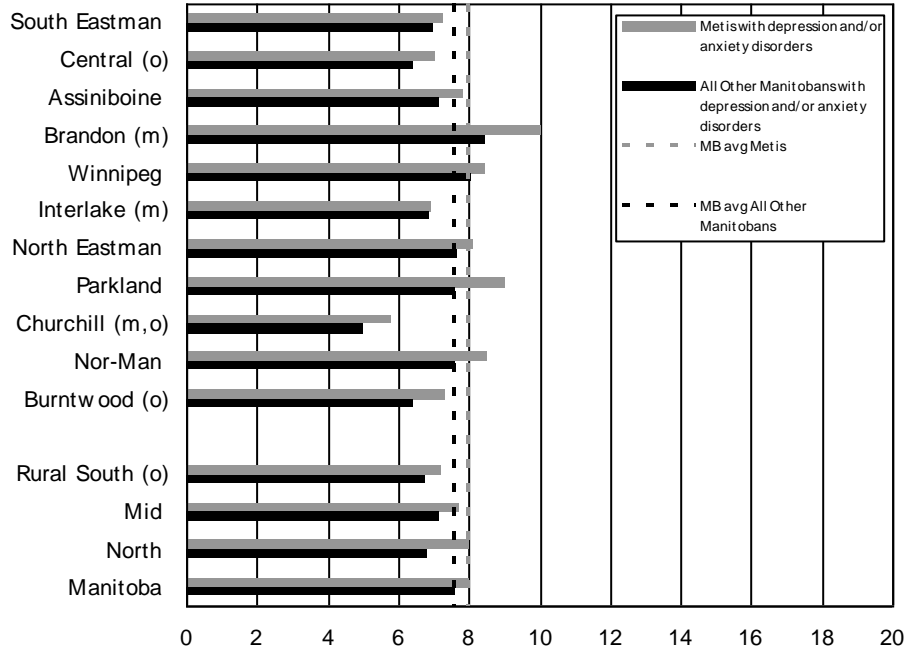
- All Other Manitobans have a lower all-cause ambulatory visit rate compared to their provincial average in Central (6.4 vs. 7.6 visits), Churchill (5.0 vs. 7.6), and Burntwood (6.4 vs. 7.6) RHAs
- There is no gradient in the ambulatory visit rate for all causes of illness in Metis and All Other Manitobans at the RHA level

Winnipeg CAs (Figure 5.1.2):

- There is no difference in ambulatory visit rate for all causes of illness between Metis and All Other Manitobans in CAs
- Metis have a higher ambulatory visit rate for all causes of illness compared to their provincial average in Downtown (10.2 vs. 8.0 visits), and Point Douglas (9.3 vs. 8.0) CAs
- All Other Manitobans have a higher ambulatory visit rate for all causes of illness compared to their provincial average in Downtown CA (8.9 vs. 7.6)
- There is no gradient in the ambulatory visit rate for all causes of illness in Metis and All Other Manitobans at the CAs level

Figure 5.1.1: All-Cause Ambulatory Visit Rate by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of ambulatory visits per resident aged 10+ years

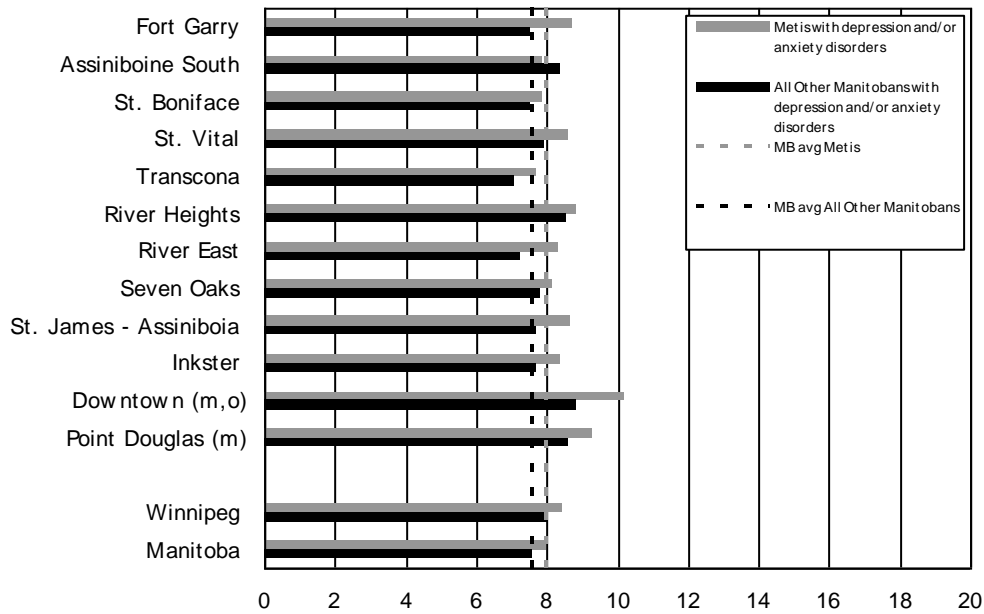


'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 5.1.2: All-Cause Ambulatory Visit Rate by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of ambulatory visits per resident aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

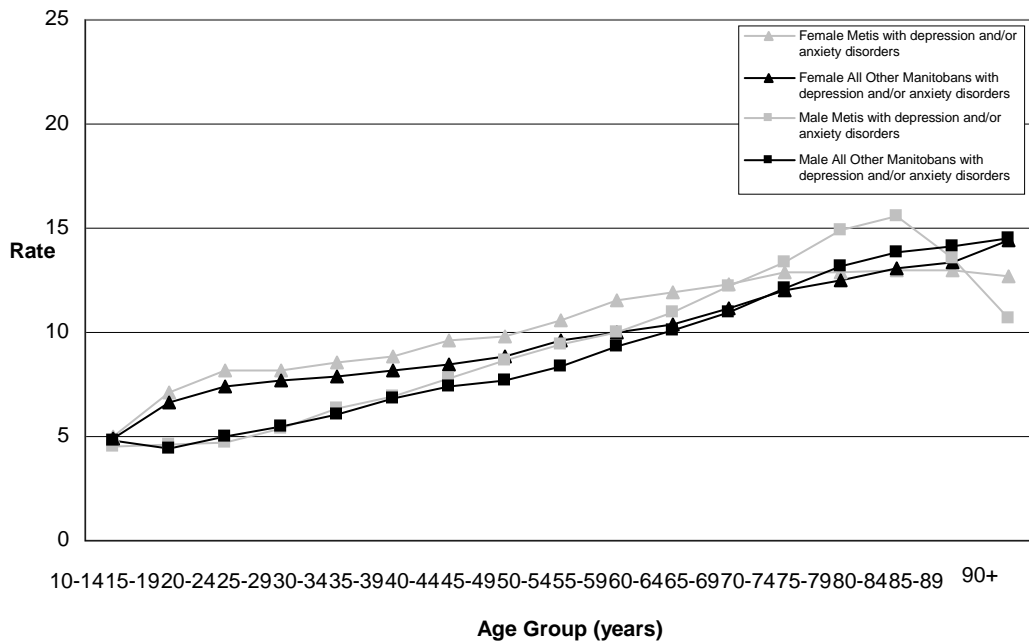
Age- and Sex-Specific:

Manitoba (Figure 5.1.3):

- Throughout most of their lives, Metis males and Metis females have an increasing ambulatory visit rate for all causes of illness
- Throughout their lives, Metis males and Metis females have a similar ambulatory visit rate for all causes of illness compared to All Other Manitoban males and All Other Manitoban females, respectively
- Throughout most of their lives, Metis males have a lower ambulatory visit rate for all causes of illness compared to Metis females until the age of 70

Figure 5.1.3: All-Cause Ambulatory Visit Rate in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Crude annual rate of ambulatory visits per resident aged 10+ years



Source: MMF, 2013

Age- and Sex-Adjusted Income Quintiles:

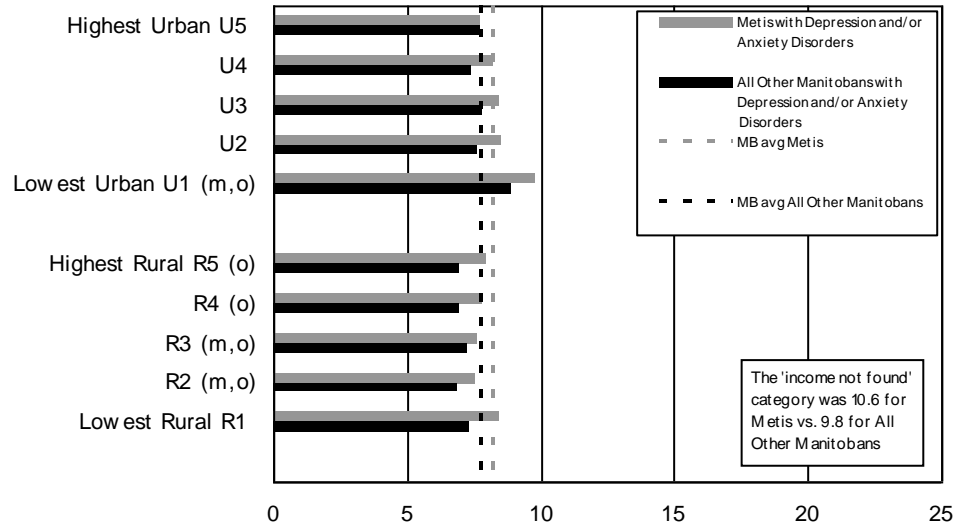
Manitoba (Figure 5.1.4):

- Urban:** Metis have a higher ambulatory visit rate for all causes of illness compared to their provincial average in U1 (9.8 vs. 8.2 visits per resident)

All Other Manitobans have a higher ambulatory visit rate for all causes of illness compared to their provincial average in U1 (8.9 vs. 7.8 visits)
- Rural:** Metis have a lower ambulatory visit rate for all causes of illness compared to their provincial average in R3 (7.7 vs. 8.2 visits) and R2 (7.5 vs. 8.2)
- All Other Manitobans have a lower ambulatory visit rate for all causes of illness compared to their provincial average in R5 (7.0 vs. 7.8 visits), R4 (7.0 vs. 7.8), R3 (7.2 vs. 7.8), and R2 (6.9 vs. 7.8)
- Income not found:** There is no statistically significant difference in the ambulatory visit rate for all causes of illness between Metis and All Other Manitobans in the ‘income not found’ group
- Linear Trend Analysis:** There is no trend for all causes-ambulatory visit rates in urban and rural Metis as well as urban and rural All Other Manitobans

Figure 5.1.4: All-Cause Ambulatory Visit Rate in Manitoba by Income Quintile for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of ambulatory visits per resident aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
'd' indicates the difference between the two groups' rates was statistically significant for this area
's' indicates data suppressed due to small numbers (five or fewer cases)

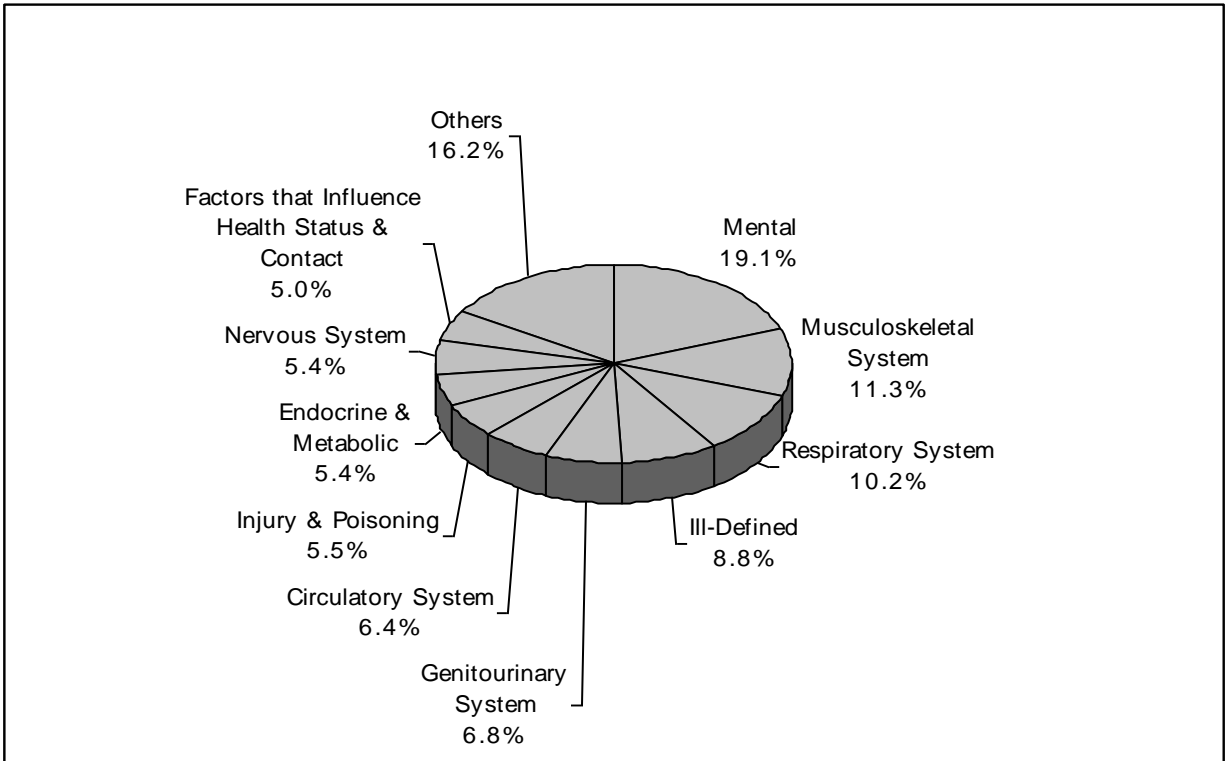
Source: MMF, 2013

Linear Trend Test Results
Urban Metis: Not Significant Urban All Other Manitobans: Not Significant
Rural Metis: Not Significant Rural All Other Manitobans: Not Significant

Causes of Ambulatory Visits (Figure 5.1.5 and Figure 5.1.6):

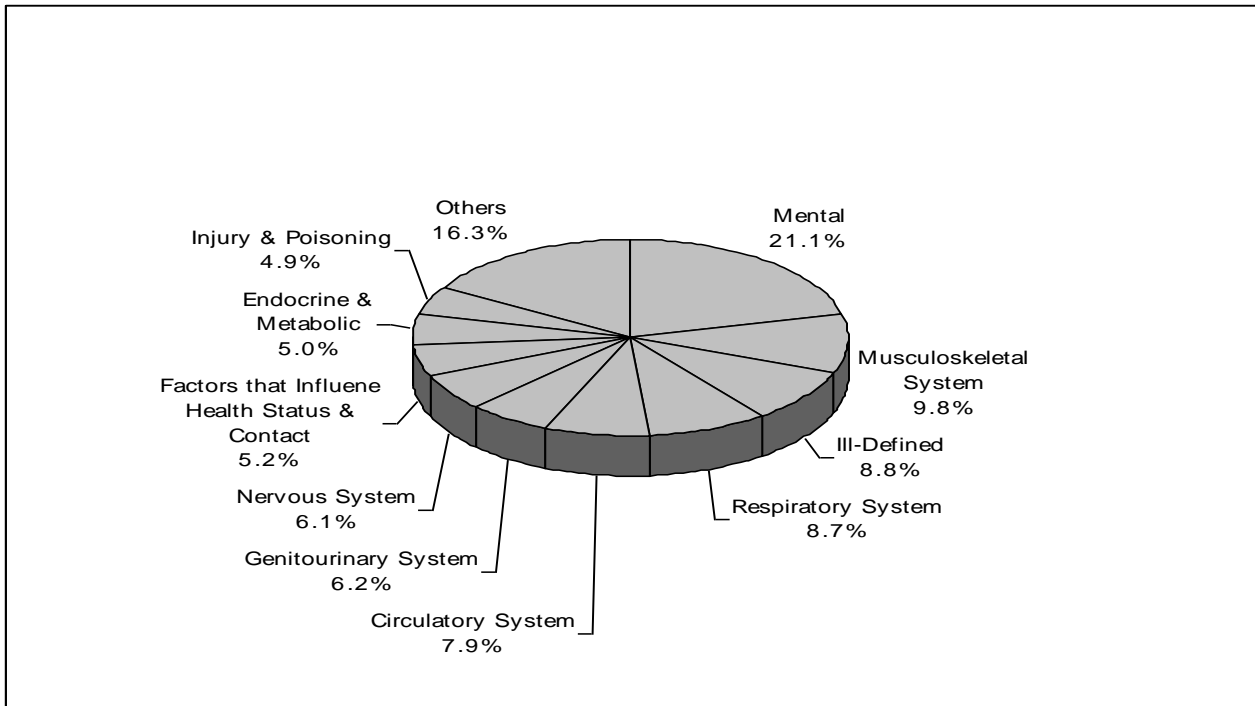
- The leading causes of ambulatory visits in Metis compared to All Other Manitobans were as follows: mental illness (19.1% vs. 21.1%), musculoskeletal system (11.3% vs. 9.8%), respiratory system (10.2% vs. 8.7%), and others (16.2% vs. 16.3%).

Figure 5.1.5: Ambulatory Visits by Cause (ICD-9 CM) for Metis in Manitoba with Depression and/or Anxiety Disorders, 2002/03-2006/07



Source: MMF, 2013

Figure 5.1.6: Ambulatory Visits by Cause (ICD-9 CM) for All Other Manitobans in Manitoba with Depression and/or Anxiety Disorders, 2002/03-2006/07



Source: MMF, 2013

Findings from Literature Review

(Compared to the results in this study – *in italics*):

It is clear that health services use by individuals with depression and/or anxiety disorders is considerably higher than in those without either condition. This is not surprising as comorbidity of these conditions with physical illnesses is common. It has been estimated that 42% of individuals with a medical disorder will have had either depression or an anxiety disorder in their lifetime (Enns et al., 2001). Similarly, there is evidence that individuals with these mental conditions are more likely to develop a physical illness (Enns et al., 2001; Patten & Juby, 2008). In 1997/98-2000/01, the age-adjusted annual rates of physician visits for all causes of illness in Manitoba were much higher for Manitoban males and females aged 10 years and older who had been diagnosed with depression (8.0 and 9.2 visits per resident, respectively) or anxiety disorders (9.8 and 11.1) compared to those with no diagnosed mental health condition (3.1 and 4.0) (Martens et al., 2004).

There is no known information related to ambulatory visits for Metis with depression and/or anxiety disorders. The Metis Atlas shows that the annual physician visit rates for all causes of illness in Metis in 2006/07 were significantly higher compared to that of All Other Manitobans provincially (5.4 vs. 4.8 visits per resident), in every RHA except Churchill, and in every Winnipeg CA except Assiniboine South (Martens, Bartlett, et al., 2010).

Little information is available about physician visits for all causes of illness by individuals with depression and/or anxiety disorders. After adjusting for other factors, Tweed et al. (1998) found no relationship between age and rate of physician visits in individuals with psychiatric diagnoses in Ontario, although they did find elevated visit rates for females. All-cause physician visit rates in Manitoba were higher in females than in males with mental disorders (8.7 vs. 7.1 visits per resident annually). In that study, males and females with a diagnosed mental disorder had visit rates more than double those of males and females without a diagnosed mental illness (Martens et al., 2004).

In a survey conducted in Ontario, physician visits by individuals with psychiatric diagnosis were significantly higher in individuals with lower education than those with higher education, after adjusting for all other factors (Tweed et al., 1998). Martens et al. (2004) found that rates of physician visits for all causes of illness among individuals with diagnosed mental disorders in rural Manitoba directly increased with income. Physician visit rates, however, showed no relationship with income in urban areas.

Some information about the causes of physician visits by individuals with depression and/or anxiety disorders is available. Martens et al. (2004) reported that 20.1% of physician visits among Manitobans with a diagnosed mental illness were for mental conditions. They revealed that physician visit rates by individuals with mental disorders for physical causes of illness were twice as high as the rates in those without any previously diagnosed mental disorder. Little information specific to Metis with depression and/or anxiety disorders is available. Martens, Bartlett, et al. (2010) reported that Metis and All Other Manitobans had similar ambulatory visit rates for mental causes (8.9% vs. 8.6%) as well as for six other leading causes of physician visits.

In this study, Metis and All Other Manitobans have similar ambulatory visit rate for all causes of illness provincially (8.0 vs. 7.6 visits). There is no difference among aggregate areas, RHAs, and Winnipeg CAs. Throughout most of their lives, Metis males have a lower crude ambulatory visit rate compared to Metis females. The three leading causes of ambulatory visits among Metis and All Other Manitobans were mental illness (19.1% vs. 21.1%, respectively), musculoskeletal disease (11.3% vs. 9.8%), and respiratory disease (10.2% vs. 8.7%).

Metis have a similar ambulatory visit rate compared to All Other Manitobans in Manitoba. This rate suggests that for those with depression and anxiety disorders access to health care services is improving over time and that the gap in health care access between Metis and All Other Manitobans is diminishing.

5.2 Ambulatory Visits for Depression and/or Anxiety Disorders

This indicator measures the average annual rate of visits to all physicians with a code for depression (ICD-9-CM codes 296, 309, or 311) or an anxiety disorder (ICD-9-CM code 300). In physician claims, only one diagnosis code is recorded for each visit. While more than one issue may be discussed during the visit, the physician must record a single code as the cause of the visit (Martens et al., 2004).

Age- and sex-adjusted and age- and sex-specific annual ambulatory visit rates for depression and/or anxiety disorders were measured per 1,000 residents in five fiscal years: 2002/03-2006/07. The denominator includes the total number of each of Metis and All Other Manitoban populations with depression and/or anxiety disorders aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of ambulatory visit rate for depression and/or anxiety disorders among Metis, the denominator is the total number of Metis population with depression and/or anxiety disorders aged 10+ years.

Key observations:

Metis and All Other Manitobans with depression and/or anxiety disorders

Manitoba (Figure 5.2.1):

- Metis and All Other Manitobans have similar ambulatory visit rate for depression and/or anxiety disorders in Manitoba (1253.2 vs. 1417.8 visits per 1,000 residents)

Aggregate areas (Figure 5.2.1):

- There is no difference between Metis and All Other Manitobans in the ambulatory visit rate for depression and/or anxiety disorders at the aggregate level
- Metis have a lower ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in Rural South (1087.4 vs. 1253.2 visits per 1,000 residents), and Mid (1073.1 vs. 1253.2) aggregate areas
- All Other Manitobans have a lower ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in Rural South (1061.6 vs. 1417.8 visits per 1,000 residents), Mid (1093.2 vs. 1417.8), and North (912.4 vs. 1417.8) aggregate areas
- There is no gradient in the ambulatory visit rate for depression and/or anxiety disorders among the aggregate areas as ordered by the PMR

RHAs (Figure 5.2.1):

- There is no difference between Metis and All Other Manitobans in the ambulatory visit rate for depression and/or anxiety disorders among RHAs
- Metis have a lower ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in Central (996.4 vs. 1253.2 visits per 1,000 residents), Parkland (999.3 vs. 1253.2), and Burntwood (767.5 vs. 1253.2) RHAs
- All Other Manitobans have a lower ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in South Eastman (1110.0 vs. 1417.8 visits per 1,000 residents), Central (1037.8 vs. 1417.8), Assiniboine (1028.7 vs. 1417.8), Interlake (1118.9 vs. 1417.8), North Eastman (1071.5 vs. 1417.8), Parkland (1027.6 vs. 1417.8),

Churchill (887.2 vs. 1417.8), Nor-Man (1114.5 vs. 1417.8), and Burntwood (701.5 vs. 1417.8) RHAs

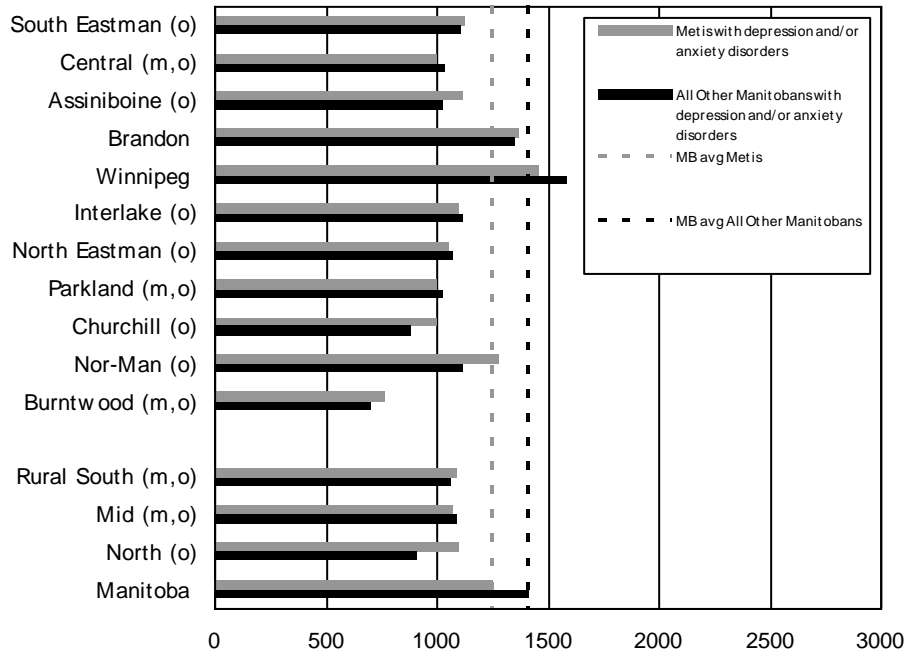
- There is no gradient in the ambulatory visit rate for depression and/or anxiety disorders in Metis and All Other Manitobans at the RHA level

Winnipeg CAs (Figure 5.2.2):

- There is no difference between Metis and All Other Manitobans in the ambulatory visit rate for depression and/or anxiety disorders among Winnipeg CAs
- Metis have a higher ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in Assiniboine South (1574.0 vs. 1253.2 visits per 1,000 residents), St. Vital (1608.6 vs. 1253.2), River Heights (1851.3 vs. 1253.2), and Downtown (1529.9 vs. 1253.2) CAs
- All Other Manitobans have a higher ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in Assiniboine South (1770.4 vs. 1417.8 visits per 1,000 residents), and River Heights (2068.3 vs. 1417.8) CAs, whereas they have a lower rate than their provincial average in Inkster (1151.8 vs. 1417.8) CA
- There is no gradient in the ambulatory visit rate for depression and/or anxiety disorders in Metis or All Other Manitobans at the CAs level

Figure 5.2.1: Ambulatory Visit Rate for Depression and/or Anxiety Disorders by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of ambulatory visits per 1,000 residents aged 10+ years

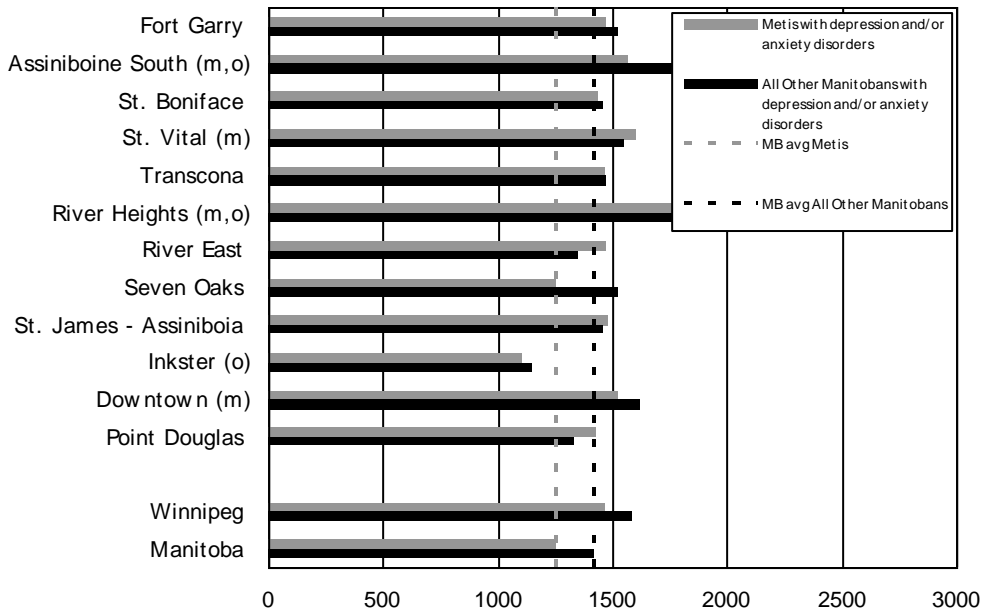


'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 5.2.2: Ambulatory Visit Rate for Depression and/or Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of ambulatory visits per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

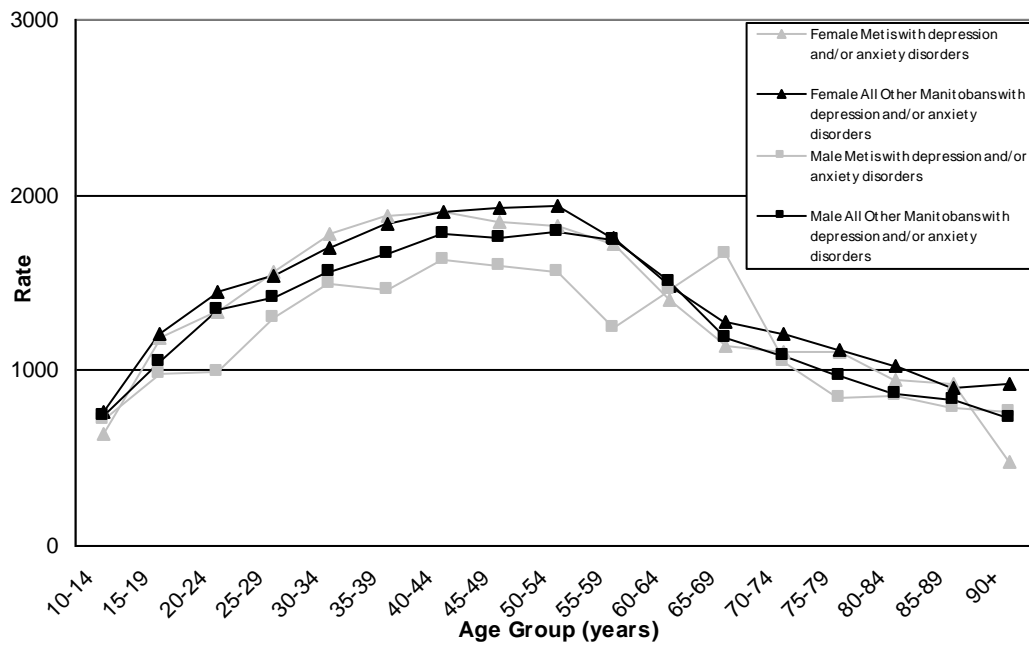
Age- and Sex-Specific:

Manitoba (Figure 5.2.3):

- Throughout most of their lives, Metis males have a lower crude ambulatory visit rate for depression and/or anxiety disorders than Metis females
- Metis males have a lower crude ambulatory visit rate for depression and/or anxiety disorders than All Other Manitoban males throughout most of their lives. However Metis females have a similar crude ambulatory visit rate for depression and/or anxiety disorders compared to All Other Manitoban females

Figure 5.2.3: Ambulatory Visit Rate for Depression and/or Anxiety Disorders in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Crude annual rate of ambulatory visits per 1,000 residents aged 10+ years



Source: MMF, 2013

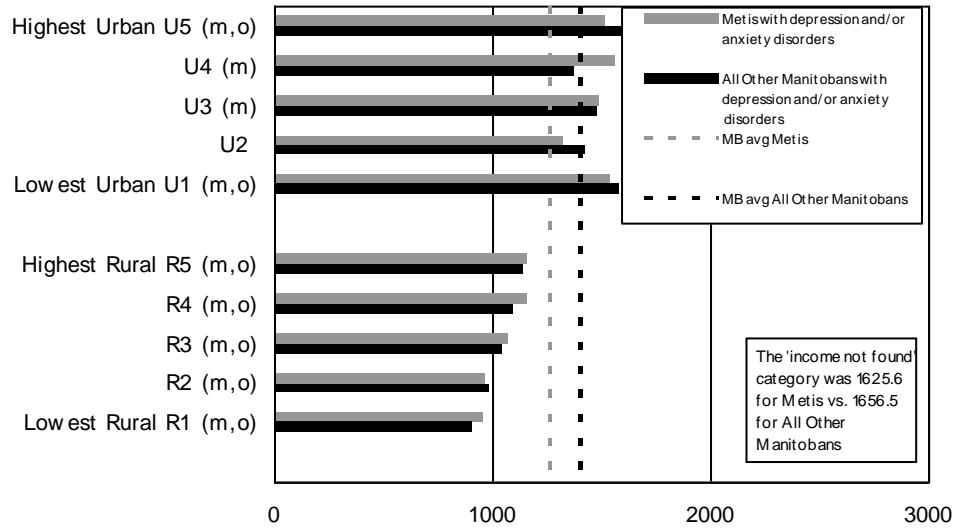
Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 5.2.4):

- **Urban:** Metis have a higher ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in U5 (1516.0 vs. 1263.9 visits per 1,000 residents), U4 (1563.7 vs. 1263.9), U3 (1488.8 vs. 1263.9), and U1 (1541.5 vs. 1263.9)
- All Other Manitobans have a higher ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in U5 (1614.9 vs. 1407.8 visits per 1,000 residents), and U1 (1577.0 vs. 1407.8)
- **Rural:** Metis have a lower ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in R5 (1156.3 vs. 1263.9 visits per 1,000 residents), R4 (1154.4 vs. 1263.9), R3 (1071.1 vs. 1263.9), R2 (963.7 vs. 1263.9), and R1 (950.2 vs. 1263.9)
- All Other Manitobans have a lower ambulatory visit rate for depression and/or anxiety disorders compared to their provincial average in R5 (1138.4 vs. 1407.8 visits per 1,000 residents), R4 (1088.1 vs. 1407.8), R3 (1049.1 vs. 1407.8), R2 (981.5 vs. 1407.8), and R1 (909.1 vs. 1407.8)
- **Income not found:** There is no difference in ambulatory visit rate for depression and/or anxiety disorders between Metis and All Other Manitobans (1625.6 vs. 1656.5 visits per 1,000 residents)
- **Linear Trend Test:** For urban Metis and All Other Manitoban Metis there is no trend for ambulatory visit rate for those with depression and/or anxiety disorders. For rural Metis and rural All Other Manitobans there is a decreasing trend in the ambulatory visit rate for those with depression and/or anxiety disorders as income quintile decreases

Figure 5.2.4: Ambulatory Visit Rate for Depression and/or Anxiety Disorders by Income Quintile for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of ambulatory visits per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results
 Urban Metis: Not Significant Urban All Other Manitobans: Not Significant
 Rural Metis: Significant (p < 0.001) Rural All Other Manitobans: Significant (p < 0.001)

Findings from Literature Review

(Compared to the results in this study – *in italics*):

Between 1997/98 and 2000/01, all-cause ambulatory visit rates were higher in individuals diagnosed with mental illness than in people with no mental illness, especially among age groups of 30 to 55 and 80+ years. The rates were lower in youth and young adults (Martens et al., 2004). The information in that study was not specific to those with depression and/or anxiety disorders. There are no previous known studies documenting the ambulatory visit rate for depression and/or anxiety disorders in Metis.

In this study, Metis and All Other Manitobans have a similar ambulatory visit rate for depression and/or anxiety disorders (1253.2 vs. 1417.8 per 1,000) in Manitoba. There is no difference among aggregate areas, RHAs, and Winnipeg CAs. In rural Metis ambulatory visit rates for depression and/or anxiety disorders decrease as neighborhood income quintiles decrease.

In this study, there was no difference between ambulatory visit rate for depression and/or anxiety disorders in Metis and All Other Manitobans based on the geographical location. Further investigation is warranted to understand why ambulatory visit rates for rural Metis concomitantly decrease as neighborhood income quintiles decrease.

5.3 Psychiatrist Visits for Depression and/or Anxiety Disorders

The age- and sex-adjusted and the age- and sex-specific annual rates for psychiatrist visits due to depression (ICD-9-CM codes 296, 309, or 311) and/ or anxiety disorders (ICD-9-CM code 300) were measured per 1,000 residents for five fiscal years: 2002/03-2006/07. Psychiatrist visits rates for depression and or anxiety disorders were identified (MD Block code 03). The denominator includes the total number of each of Metis and All Other Manitoban populations with depression and/or anxiety disorders aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of psychiatrists visit rate for depression and/or anxiety disorders among Metis, the denominator is the total number of Metis population with depression and/or anxiety disorders aged 10+ years.

Key observations:

Metis and All Other Manitobans with depression and/or anxiety disorders

Manitoba (Figure 5.3.1):

- There is no difference between Metis and All Other Manitobans in the psychiatrist visit rate due to depression and/or anxiety disorders in Manitoba (193.7 vs. 260.6 visits per 1,000 residents)

Aggregate areas (Figure 5.3.1):

- There is no difference between Metis and All Other Manitobans in the psychiatrist visit rate in any of the aggregate areas
- Metis have a lower psychiatrist visit rate compared to their provincial average in Rural South (106.9 vs. 193.7 visits per 1,000 residents), Mid (124.6 vs. 193.7), and North (26.9 vs. 193.7) aggregate areas
- All Other Manitobans have a lower psychiatrist visit rate compared to their provincial average in Rural South (82.1 vs. 260.6 visits per 1,000 residents), Mid (111.6 vs. 260.6), and North (47.6 vs. 260.6) aggregate areas
- There is no gradient for the psychiatrist visit rate due to depression and/or anxiety disorders in Metis and All Other Manitobans at the aggregate areas as ordered by the PMR

RHAs (Figure 5.3.1):

- There is no difference between Metis and All Other Manitobans in the psychiatrist visit rate in any of the RHAs
- Metis have a higher psychiatrists visit rate compared to their provincial average in Winnipeg RHA (341.8 vs. 193.7 visits per 1,000 residents), whereas they have a lower psychiatrist visit rate in Central (83.0 vs. 193.7), North Eastman (76.9 vs. 193.7), Parkland (44.3 vs. 193.7), Churchill (55.5 vs. 193.7), Nor-Man (6.1 vs. 193.7), and Burntwood (46.5 vs. 193.7) RHAs
- All Other Manitobans have a lower psychiatrist visit rate compared to their provincial average in South Eastman (72.2 vs. 260.6 visits per 1,000 residents), Central (82.7 vs. 260.6), Assiniboine (72.6 vs. 260.6), Interlake (127.3 vs. 260.6), North Eastman (119.9 vs. 260.6), Parkland (44.3 vs. 260.6), Churchill (131.6 vs. 260.6), Nor-Man (18.6 vs. 260.6), and Burntwood (63.4 vs. 260.6) RHAs

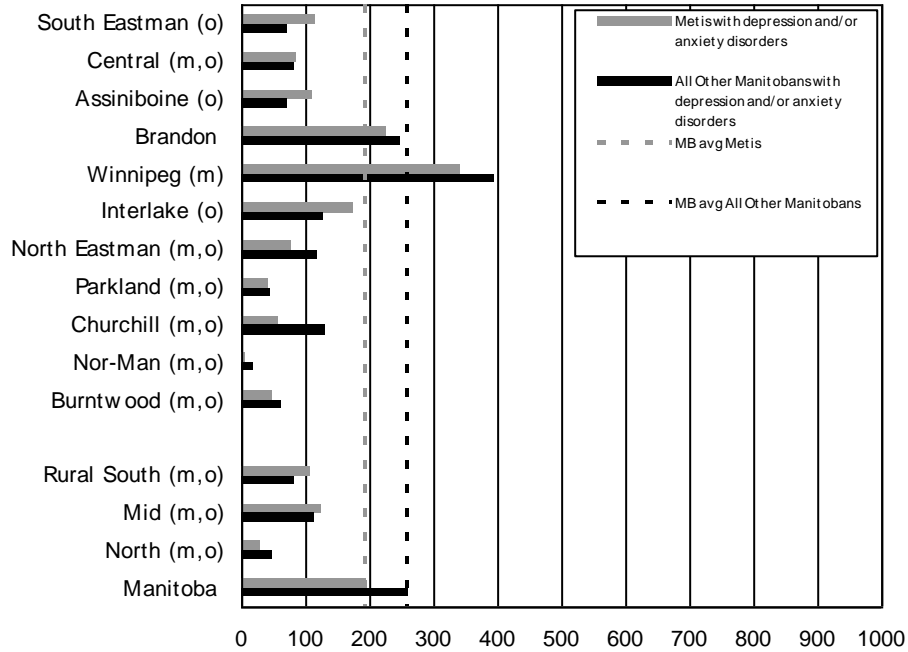
- There is no gradient for the psychiatrist visit rate due to depression and/or anxiety disorders in Metis and All Other Manitobans at the RHA level

Winnipeg CAs (Figure 5.3.2):

- There is no difference between Metis and All Other Manitobans in the psychiatrist visit rate at the CA level
- Metis have a higher psychiatrist visit rate compared to their provincial average in Assiniboine South (410.0 vs. 193.7 visits per 1,000 residents), St. Vital (435.9 vs. 193.7), River Heights (483.3 vs. 193.7), St. James – Assiniboia (369.5 vs. 193.7), and Point Douglas (347.3 vs. 193.7) CAs
- All Other Manitobans have a higher psychiatrist visit rate compared to their provincial average in Assiniboine South (561.2 vs. 260.6 visits per 1,000 residents), and River Heights (650.2 vs. 260.6) CAs
- There is no gradient in the psychiatrist visit rate due to depression and/or anxiety disorders in Metis and All Other Manitobans at the CAs level

Figure 5.3.1: Psychiatrist Visit Rate due to Depression and/or Anxiety Disorders by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of visits to psychiatrist per 1,000 residents aged 10+ years

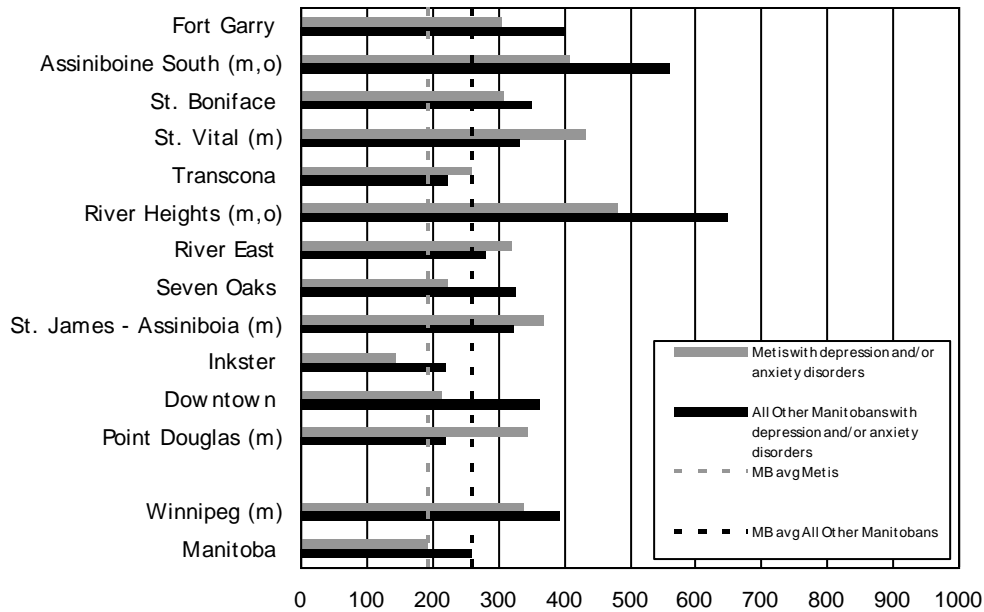


'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 5.3.2: Psychiatrist Visit Rate due to Depression and/or Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of visits to psychiatrist per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

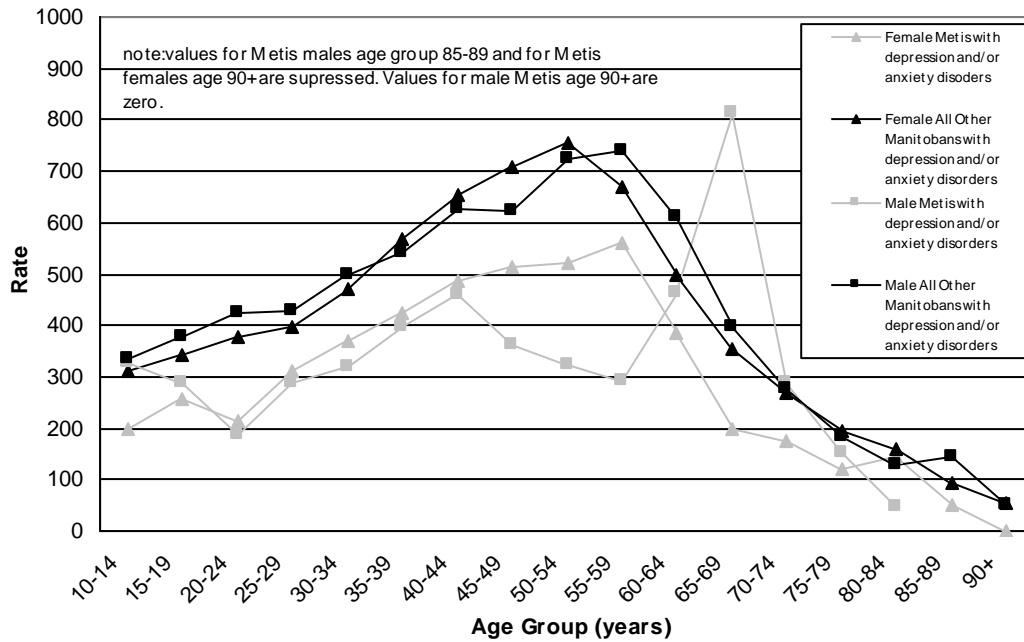
Age- and Sex-Specific:

Manitoba (Figure 5.3.3):

- Throughout their lives, Metis males and Metis females have similar crude psychiatrist visit rate until the age of 45, followed by hectic peaks of psychiatrists visit rate at different age groups for both Metis males and Metis females
- Throughout their lives, Metis males and females have a lower crude psychiatrist visit rate compared to All Other Manitoban males and females, respectively

Figure 5.3.3: Psychiatrist Visit Rate due to Depression and/or Anxiety Disorders in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Crude annual rate of visits to psychiatrists per 1,000 residents aged 10+ years



Source: MMF, 2013

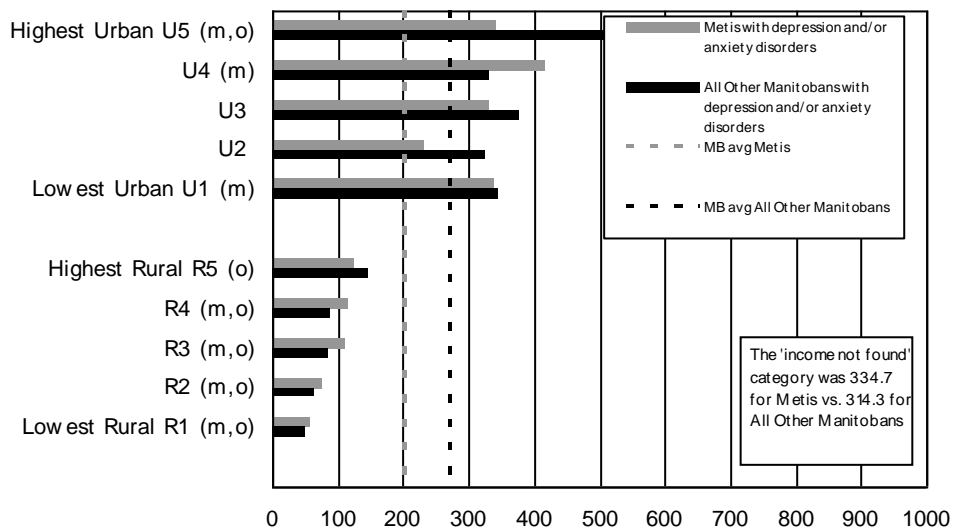
Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 5.3.4):

- **Urban:** Metis have a higher psychiatrist visit rate compared to their provincial average in U5 (343.6 vs. 202.4 visits per 1,000), U4 (416.0 vs. 202.4), and U1 (339.1 vs. 202.4)
- All Other Manitobans have a higher psychiatrist visit rate compared to their provincial average in U5 (507.4 vs. 270.9 visits per 1,000 residents)
- **Rural:** Metis have a lower psychiatrists visit rate compared to their provincial average in R4 (117.1 vs. 202.4 visits per 1,000 residents), R3 (110.6 vs. 202.4), R2 (77.4 vs. 202.4), and R1 (58.6 vs. 202.4)
- All Other Manitobans have a lower psychiatrist visit rate compared to their provincial average in R5 (147.9 vs. 270.9 visits per 1,000 residents), R4 (89.2 vs. 270.9), R3 (84.6 vs. 270.9), R2 (63.1 vs. 270.9), and R1 (50.1 vs. 270.9)
- **Income not found:** There is no difference in the psychiatrist visit rate between Metis and All Other Manitobans (334.7 vs. 314.3 visits per 1,000 residents)
- **Linear Trend test:** For urban Metis and urban All Other Manitobans there is no linear trend for the psychiatrist visit rate for individuals with depression and/or anxiety disorders. For both rural Metis and rural All Other Manitobans the rate of visits to psychiatrists decreases as the income quintiles decrease

Figure 5.3.4: Psychiatrist Visit Rate due to Depression and/or Anxiety Disorders in Manitoba by Income Quintile for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of visits to psychiatrists per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
'd' indicates the difference between the two groups' rates was statistically significant for this area
's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results

Urban Metis: Not Significant Urban All Other Manitobans: Not Significant
Rural Metis: Significant (p < 0.001) Rural All Other Manitobans: Significant (p < 0.001)

Findings from Literature Review

(Compared to the results in this study – *in italics*):

Psychiatrist visit rate is an important public health indicator of mental health status within the population (Bhui & Dinos, 2011). There is no information on global and national rates of psychiatrist visits for the general population with depression and/or anxiety disorders. However, age, sex, and income information for the psychiatrist visit rates in the general Manitoba population are known. For Manitobans with cumulative mental illness (CMI) the age-adjusted annual rate of visits to psychiatrist per resident aged 10 years and older was 0.55 for males compared to 0.53 for females between the period 1997/98 to 2001/02 (Martens et al., 2004). In addition, age- and sex-specific visit rates to psychiatrists are similar for males and females with CMI in Manitoba. The highest rates in both sexes were observed between the ages of 35 to 50 years in the period 1997/98 to 2001/02 (Martens, et al., 2004).

Family physicians play an important role in the treatment of mental disorders. The percentage of adults with a mental health disorder seen solely by a family physician increased from 38.8% to 45.0% compared with a decrease in those seen by a psychiatrist alone from 3.7% to 2.4% in the period between 1992/93 and 2000/01 (Watson, Heppner, Roos, Reid, & Katz, 2005). In addition, those living in the lowest SES had a higher rate of visits to family physicians and psychiatrists for mental disorders compared to those living in the highest SES (Watson, Heppner, Roos, Reid, & Katz, 2005). There is no known information specific to visit rates to psychiatrists for depression and/or anxiety disorders in the Metis population of Manitoba.

In our study, there is no difference between Metis and All Other Manitobans in the psychiatrist visit rate at the provincial level (193.7 vs. 260.6 per 1,000), as well as in every aggregate area, RHA, and Winnipeg CA. For Metis living in rural areas, there was a trend for psychiatrist visit rate that decreased from the highest to the lowest income quintiles.

Although there are no differences between Metis and All Other Manitobans in the psychiatrists visit rates, the fact that Metis males and females have a lower crude psychiatrist visit rate compared to All Other Manitoban males and females warrants further investigation. It may also be of interest, and a question of access, to note the lower rates of psychiatrist visits by all rural residents with depression and anxiety disorders compared to their urban counterparts.

5.4 Hospital Separations for All Causes

A separation from a health care facility occurs anytime a patient (or resident) leaves the health care facility because of death, discharge, or transfer. The rate of hospital separations is the most commonly used measure of utilization of hospital services. Separations rather than admissions are used because hospital abstracts for patient care are based on information gathered at the time of discharge. The words 'separation', 'discharge', and 'stay' are used interchangeably.

The age- and sex-adjusted and the age- and sex-specific annual rates of hospitalizations per 1,000 residents were measured for five fiscal years: 2002/03- 2006/07. The denominator includes the total number of each of Metis and All Other Manitoban populations with depression and/or anxiety disorders aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of hospital separations due to all causes of illness among Metis, the denominator is the total number of Metis population with depression and/or anxiety disorders aged 10+ years.

For this indicator, both inpatient hospital stays and surgical outpatient records were included. Newborn (birth) hospitalizations were excluded. Multiple admissions of the same person were counted as separate events only if he/she was admitted to the hospital for different causes. All acute care hospitals in Manitoba were included; however, mental health centres (Selkirk, Eden), Personal Care Homes, and Long-Term Care facilities (Riverview, Deer Lodge, Rehabilitation Centre for Children, and Adolescent Treatment Centre) were excluded. Outpatient hospital separations with a principal procedure code for a biopsy were not included because hospitals are no longer filing hospital abstracts for patients visiting hospitals for biopsy as of April 1, 2001.

The pie charts included in this subsection indicate the most common causes of hospital separations (inpatient and outpatient) for Metis and All Other Manitobans with depression and/or anxiety disorders, based on the coded diagnosis (as in ICD-10-CA). Information for the pie charts is based on crude rates instead of the adjusted rates.

Key observations:

Metis and All Other Manitobans with depression and/or anxiety disorders

Manitoba (Figure 5.4.1):

- There is no difference in all-cause hospital separation rate for Metis compared to All Other Manitobans in Manitoba (331.3 vs. 268.9 separations per 1,000 residents)

Aggregate areas (Figure 5.4.1):

- There are no differences in all-cause hospital separation rate for Metis compared to All Other Manitobans at the aggregate level
- Metis have a higher all-cause hospital separation rate compared to their provincial average in North aggregate area (473.5 vs. 331.3 separations per 1,000 residents)
- All Other Manitobans have a higher all-cause hospital separation rate compared to their provincial average in North aggregate area (488.97 vs. 268.92 separations per 1,000 residents)
- There is a gradient for all-cause hospital separation rate in both Metis and All Other Manitobans that increases from the most healthy to the least healthy aggregate areas as ordered by the PMR

RHAs (Figure 5.4.1):

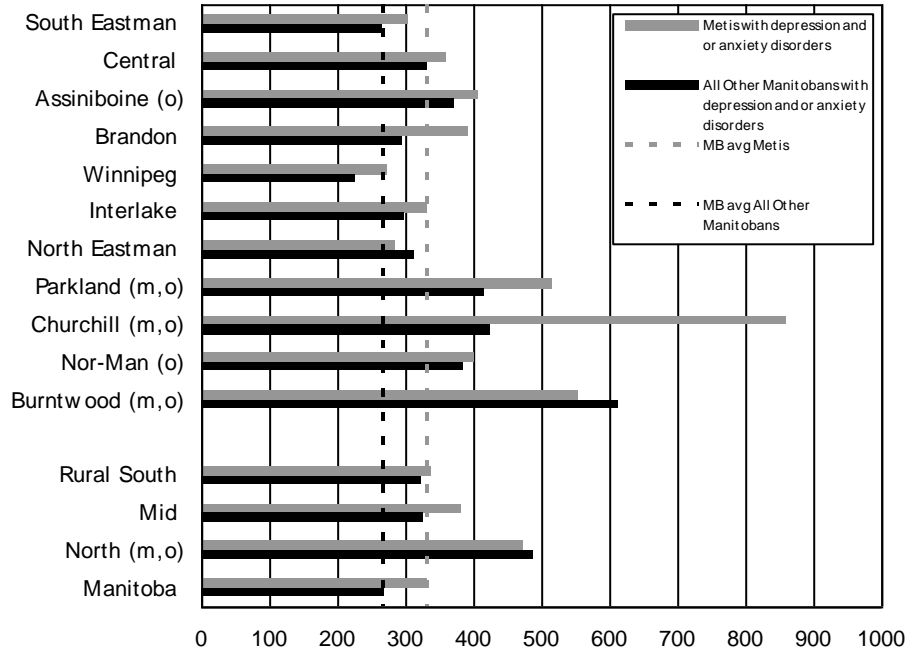
- There is no difference in all-cause hospital separation rate for Metis compared to All Other Manitobans at the RHA level
- Metis have a higher all-cause hospital separation rate compared to their provincial average in Parkland (515.7 vs. 331.3 separations per 1,000 residents), Churchill (858.46 vs. 331.3), and Burntwood (552.2 vs. 331.3) RHAs
- All Other Manitobans have a higher all-cause hospital separation rate compared to their provincial average in Assiniboine (370.1 vs. 268.9 separations per 1,000 residents), Parkland (415.90 vs. 268.9), Churchill (422.9 vs. 268.9), Nor-Man (386.3 vs. 268.9), and Burntwood (610.9 vs. 268.9) RHAs
- There is no gradient for all-cause hospital separation rate for Metis or All Other Manitobans at the RHA level

Winnipeg CAs (Figure 5.4.2):

- There is no difference for all-cause hospital separation rate for Metis compared to All Other Manitobans at the Winnipeg CAs level
- Metis have a lower all-cause hospital separation rate compared to their provincial average in Assiniboine South (220.6 vs. 331.3 separations per 1,000 residents), St. Boniface (243.7 vs. 331.3), and St. James- Assiniboia (237.8 vs. 331.3) CAs
- There is no gradient for all-cause hospital separation rate for Metis or All Other Manitobans at the CAs level

Figure 5.4.1: All-Cause Hospital Separation Rate by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of hospital separations per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx

'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx

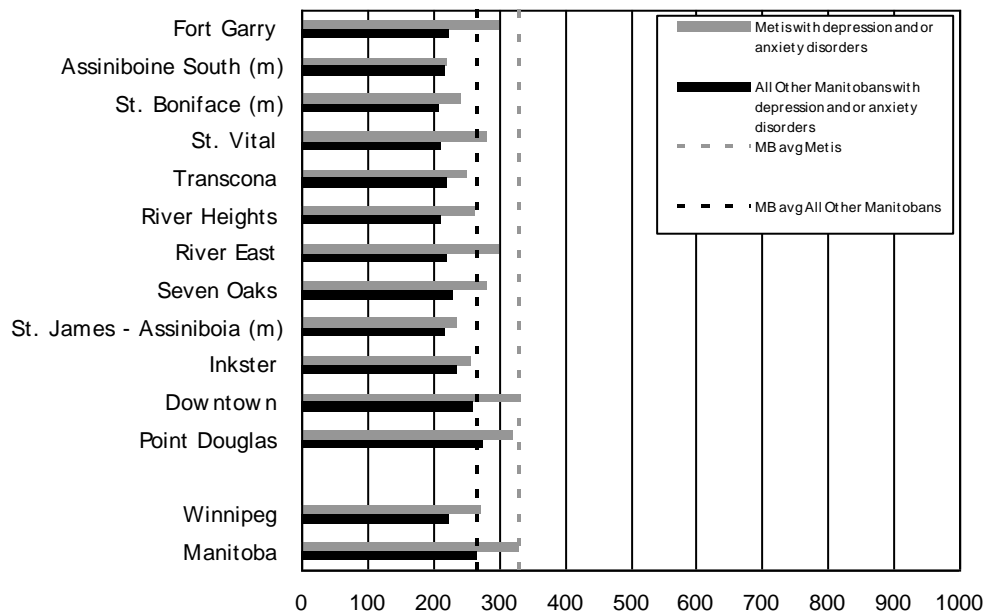
'd' indicates the difference between the two groups' rates was statistically significant for this area

's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 5.4.2: All-Cause Hospital Separation Rate by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of hospital separations per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx

'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx

'd' indicates the difference between the two groups' rates was statistically significant for this area

's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

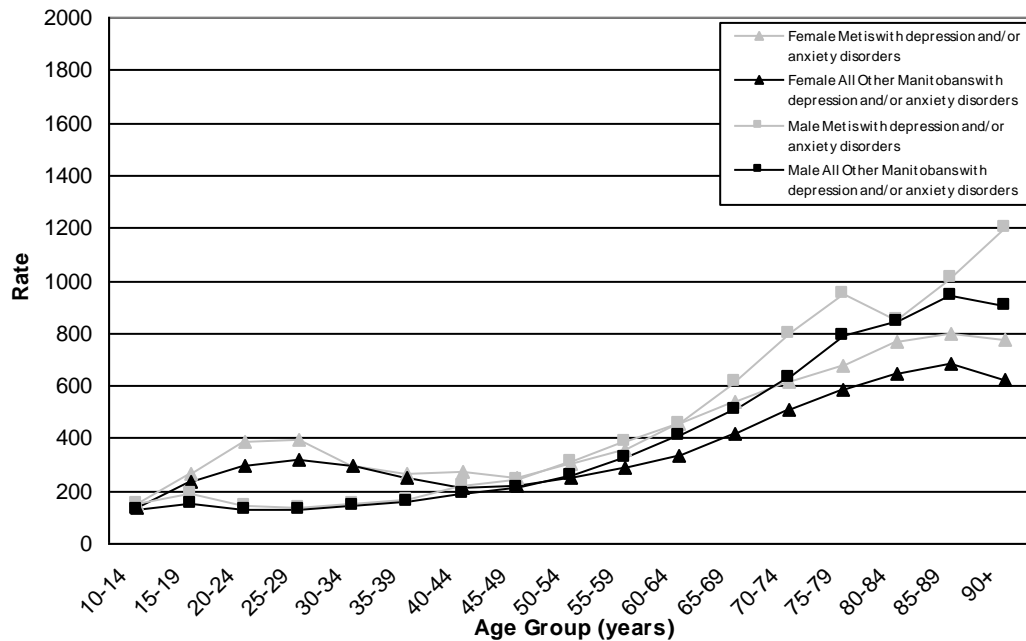
Age- and Sex-Specific:

Manitoba (Figure 5.4.3):

- Throughout most of their lives, the crude all-cause hospital separation rate for both Metis males and females is stationary until the age of 50 when it increases with age
- All-cause hospital separation rates for both Metis males and females are similar to those of All Other Manitoban males and females, respectively
- Metis males have a lower all-cause hospital separation rate compared to Metis females until the age of 45. Then, hospital separation rates become approximately the same until the age of 65 when hospital separation rate of Metis males peaks over that of Metis females

Figure 5.4.3: All-Cause Hospital Separation Rate in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of hospital separations per 1,000 residents aged 10+ years



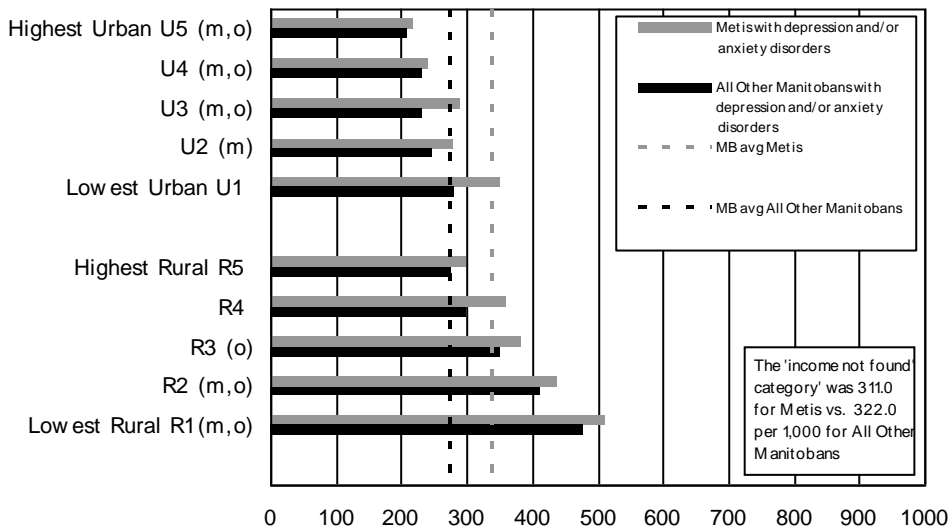
Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 5.4.4):

- **Urban:** Metis have a lower all-cause hospital separation rate compared to their provincial average in U5 (216.8 vs. 340.4 separations per 1,000 residents), U4 (242.7 vs. 340.4), U3 (289.6 vs. 340.4), and U2 (278.4 vs. 340.4)
- All Other Manitobans have a lower all-cause hospital separation rate compared to their provincial average in U5 (208.1 vs. 274.1 separations per 1,000 residents), U4 (231.8 vs. 274.1), and U3 (233.6 vs. 274.1)
- **Rural:** Metis have a higher all-cause hospital separation rate compared to their provincial average in R2 (437.6 vs. 340.4 separations per 1,000 residents), and R1 (511.0 vs. 340.4)
- All Other Manitobans have a higher all-cause hospital separation rate compared to their provincial average in R3 (350.7 vs. 274.1 separations per 1,000 residents), R2 (413.3 vs. 274.1), and R1 (478.0 vs. 274.1)
- **Income not found:** There was difference in all-cause hospital separation rate for Metis and All Other Manitobans (311.0 vs. 322.0 separations per 1,000 residents) in Manitoba
- **Linear Trend Analysis:** For both urban Metis and urban All Other Manitobans there is no trend for all-cause hospital separation rate. However, for both rural Metis and rural All Other Manitobans, all-cause hospital separation rate increases as income quintiles decrease

Figure 5.4.4: All-Cause Hospital Separation Rate by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of hospital separations per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

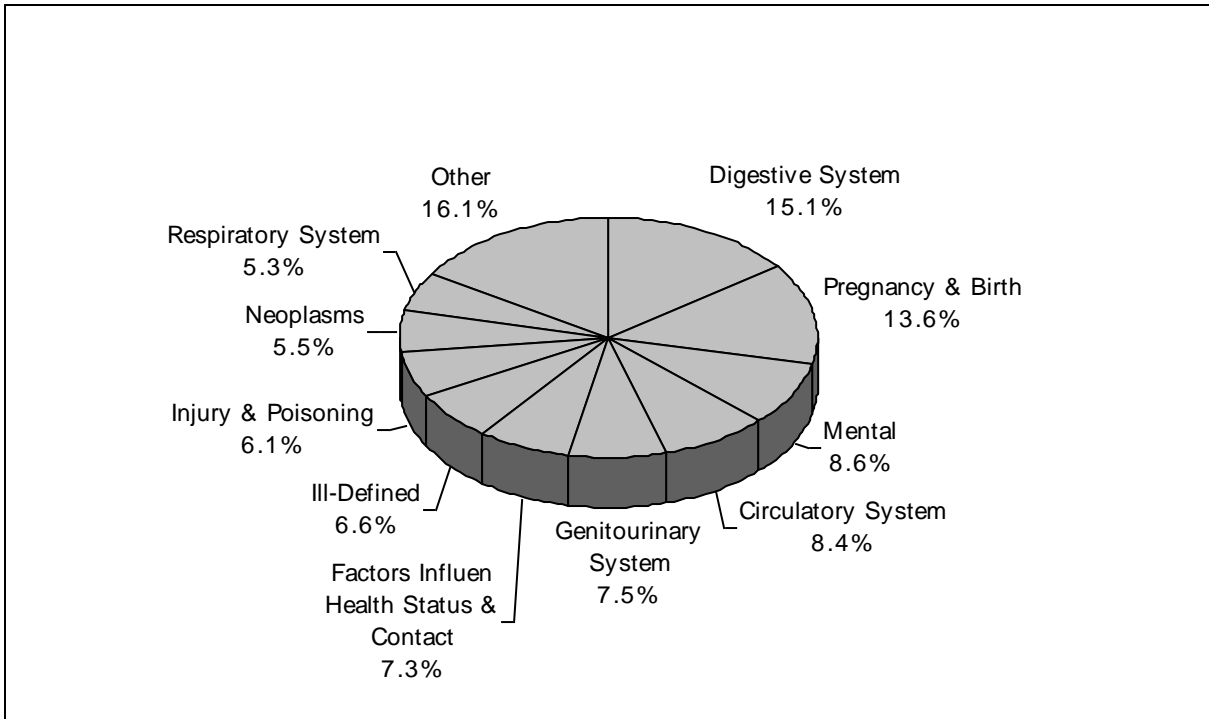
Linear Trend Test Results

Urban Metis: Not Significant Urban All Other Manitobans: Not Significant
 Rural Metis: Significant (p < 0.001) Rural All Other Manitobans: Significant (p < 0.001)

All-Cause Hospital Separations by cause of admission (Figure 5.4.5 and Figure 5.4.6):

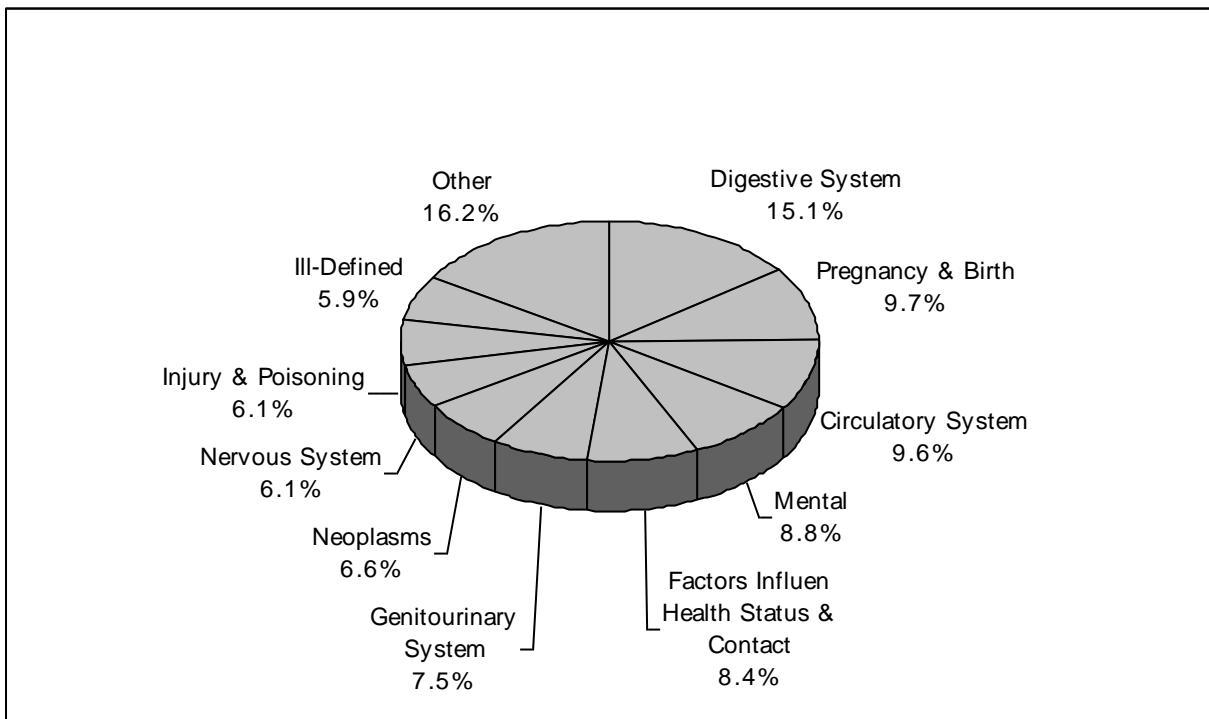
- The top four leading causes of admission to hospitals in Metis and All Other Manitobans were as follows: digestive system disorders (15.1% vs. 15.1%, respectively), pregnancy and birth (13.6% vs. 9.7%), mental (8.6% vs. 8.8%), and circulatory system (8.4% vs. 9.6%)

Figure 5.4.5: Hospital Separations by Cause (ICD-9 CM) in Manitoba for Metis with Depression and/or Anxiety Disorders, 2002/03-2006/07



Source: MMF, 2013

Figure 5.4.6: Hospital Separations by Cause (ICD-9 CM) in Manitoba for All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07



Source: MMF, 2013

Findings from Literature Review

(Compared to the results in this study – *in italics*):

It is common for physical illness to exist as a comorbidity of depression and/or anxiety disorders. Conversely, depression and anxiety disorders are common in people living with physical illness or disability (Aina & Susman, 2006). Consequently, it is expected that individuals with depression and/or anxiety disorders will demonstrate higher rates of hospital separations than those who did not experience any of these disorders. In 1997/98-2000/01, Manitoban males with depression had an age-adjusted annual rate of 253 hospital separations from acute care facilities per 1,000 residents for all causes, compared to 250 for those with anxiety disorders, and 102 for those with no mental health condition. The corresponding rates for females were 303 separations per 1,000 residents for those with depression, 333 for those with anxiety disorders, and 152 for those with no mental health condition (Martens et al., 2004). The differences between males and females in that study were almost entirely due to pregnancy and birth-related hospitalizations.

While there is no known information related to acute care hospital separations for Metis with depression and/or anxiety disorders, the Metis Atlas demonstrated that the annual hospital separation rates for the general Manitoba Metis population in 2006/07 were significantly higher than those of All Other Manitoban population provincially (194 vs. 154 separations per 1,000 residents), in 5 out of the 11 RHAs, and in 8 out of the 12 Winnipeg CAs (Martens, Bartlett, et al., 2010).

While there are no known studies about the relationship between hospital separations and personal variables such as age, sex, and income in Metis with depression and/or anxiety disorders, Martens et al. (2004) provided important related information about Manitobans with mental illnesses. In their study, hospital separation rates for all causes of illness in males increased slowly from age 10 to around age 40 and then dramatically increased throughout their lives. For females, hospital separation rates were lowest at age 10, increased in the 20-34 age range (most probably due to pregnancy and birth), and then peaked in older age groups. Martens et al. (2004) found that among those with mental illness, 13% of males had been previously admitted to hospitals for treatment of mental disorders compared to 8% of females. There was no age- and sex-specific information related to hospital separations in the Metis Atlas (Martens, Bartlett, et al., 2010).

For the general Metis population, the leading three reasons for hospital separations in 2006/07 were very similar to those for the general All Other Manitoban population (Martens, Bartlett, et al., 2010). In that study, mental disorders were not included in the top 11 causes of hospital separations for either Metis or All Other Manitobans. The information in that study was not specific to those living with depression and/or anxiety disorders.

In this study, there is no difference in all-cause hospital separation rate for Metis compared to All Other Manitobans (331.3 vs. 268.9 separations per 1,000 residents) neither provincially, nor among aggregate areas, RHAs, and Winnipeg CAs. Among income quintiles for rural Metis all-cause hospital separation rate increases with the decreasing neighborhood income quintiles.

5.5 Hospital Separations due to Depression and/or Anxiety Disorders

This indicator measures the average annual number of hospital separations with the diagnosis of depression (ICD-9-CM codes 296, 309, or 311) or anxiety disorders (ICD-9-CM code 300). Mental illnesses are not always recorded as the ‘most responsible’ diagnosis in a hospital separation even when hospitalizations include care for a mental illness (Martens et al., 2004). As a result, the rates for this indicator may underestimate total hospital separations due to depression and/or anxiety disorders.

The age- and sex-adjusted and the age- and sex-specific annual hospital separation rates due to depression and/or anxiety disorders were measured per 1,000 residents for five fiscal years: 2002/03-2006/07. The denominator includes the total number of each of Metis and All Other Manitoban populations with depression and/or anxiety disorders aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of hospital separations due to depression and/or anxiety disorders among Metis, the denominator is the total number of Metis population with depression and/or anxiety disorders aged 10+ years.

As with the previous indicator (sub-section 5.4), multiple admissions of the same person were counted as separate events only if he/she is admitted to the hospital for different causes. All acute care hospitals in Manitoba were included; mental health centers (Selkirk, Eden), Personal Care Homes, and Long-Term Care facilities (Riverview, Deer Lodge, Rehabilitation Centre for Children, and Adolescent Treatment Centre) were excluded.

Key observations:

Metis and All Other Manitobans with depression and/or anxiety disorders

Manitoba (Figure 5.5.1):

- Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans (56.8 vs. 42.9 separations per 1,000 residents) in Manitoba

Aggregate areas (Figure 5.5.1):

- Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in Mid aggregate area (79.4 vs. 63.1 separations per 1,000 residents), whereas they have a lower hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in Rural South aggregate area (58.8 vs. 69.0)
- Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in Mid (79.4 vs. 56.8 separations per 1,000 residents) and North (86.6 vs. 56.8) aggregate areas
- All Other Manitobans have a higher hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in Rural South (69.0 vs. 42.9 separations per 1,000 residents), Mid (63.1 vs. 42.9) and North (76.7 vs. 42.9 per 1,000) aggregate areas

- There is a clear gradient for hospital separation rate due to depression and/or anxiety disorders in Metis from the most healthy to the least healthy aggregate areas as ordered by the PMR

RHAs (Figure 5.5.1):

- Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in Brandon (73.3 vs. 45.6 separations per 1,000 residents), Winnipeg (37.0 vs. 29.7), Interlake (60.3 vs. 44.3), Parkland (134.9 vs. 106.3), and Churchill (310.4 vs. 131.6) RHAs, whereas they have a lower hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in North Eastman RHA (36.5 vs. 52.6)
- Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in Central (74.2 vs. 56.8 separations per 1,000 residents), Assiniboine (85.9 vs. 56.8), Parkland (134.9 vs. 56.8), Churchill (310.4 vs. 56.8), Nor-Man (82.5 vs. 56.8), and Burntwood (81.8 vs. 56.8) RHAs, whereas they have a lower hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in South Eastman (34.8 vs. 56.8), Winnipeg (37.0 vs. 56.8), and North Eastman (36.5 vs. 56.8) RHAs
- All Other Manitobans have a higher hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in Central (79.5 vs. 42.9 separations per 1,000 residents), Assiniboine (82.2 vs. 42.9), North Eastman (52.6 vs. 42.9), Parkland (106.3 vs. 42.9), Churchill (131.6 vs. 42.9), Nor-Man (72.1 vs. 42.9), and Burntwood (81.0 vs. 42.9) RHAs, whereas they have a lower hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in Winnipeg (29.7 vs. 42.9) RHA
- There is no gradient for hospital separation rate due to depression and/or anxiety disorders in Metis or All Other Manitobans at the RHA level

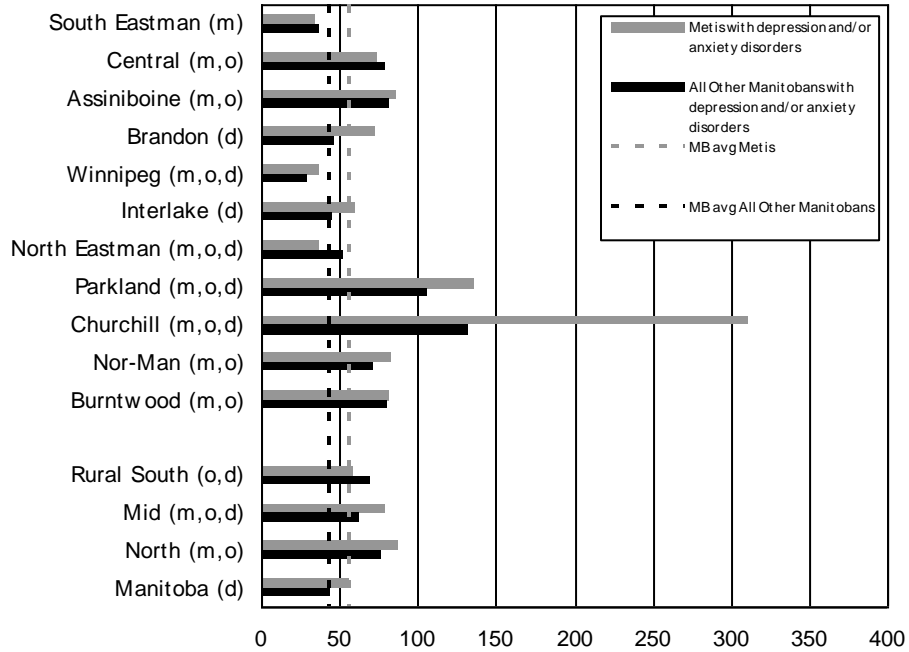
Winnipeg CAs (Figure 5.5.2):

- Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in River Heights (59.7 vs. 32.9 separations per 1,000 residents), River East (48.0 vs. 27.7), and Seven Oaks (41.6 vs. 24.8) CAs, whereas they have a lower hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in St. James – Assiniboia (15.4 vs. 28.4) CA
- Metis have a lower hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in Assiniboine South (24.4 vs. 56.8 separations per 1,000 residents), St. Boniface (32.3 vs. 56.8), St. Vital (36.5 vs. 56.8), Transcona (23.4 vs. 56.8), St. James-Assiniboia (15.4 vs. 56.8), Inkster (31.8 vs. 56.8), and Point Douglas (26.2 vs. 56.8) CAs
- All Other Manitobans have a lower hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in Fort Garry (34.5 vs. 42.9 separations per 1,000 residents), Assiniboine South (27.6 vs. 42.9), St. Boniface (31.0 vs. 42.9), St. Vital (30.2 vs. 42.9), Transcona (20.1 vs. 42.9), River Heights (32.9 vs. 42.9), River East (27.7 vs. 42.9), Seven Oaks (24.7 vs. 42.9), St. James – Assiniboia (28.4 vs. 42.9), Inkster (28.3 vs. 42.9), and Point Douglas (32.7 vs. 42.9) CAs

- There is no gradient for hospital separation rate due to depression and/or anxiety disorders neither in Metis nor in All Other Manitobans at the CA level

Figure 5.5.1: Hospital Separation Rate due to Depression and/or Anxiety Disorders by RHAs for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of hospital separations per 1,000 residents aged 10+ years

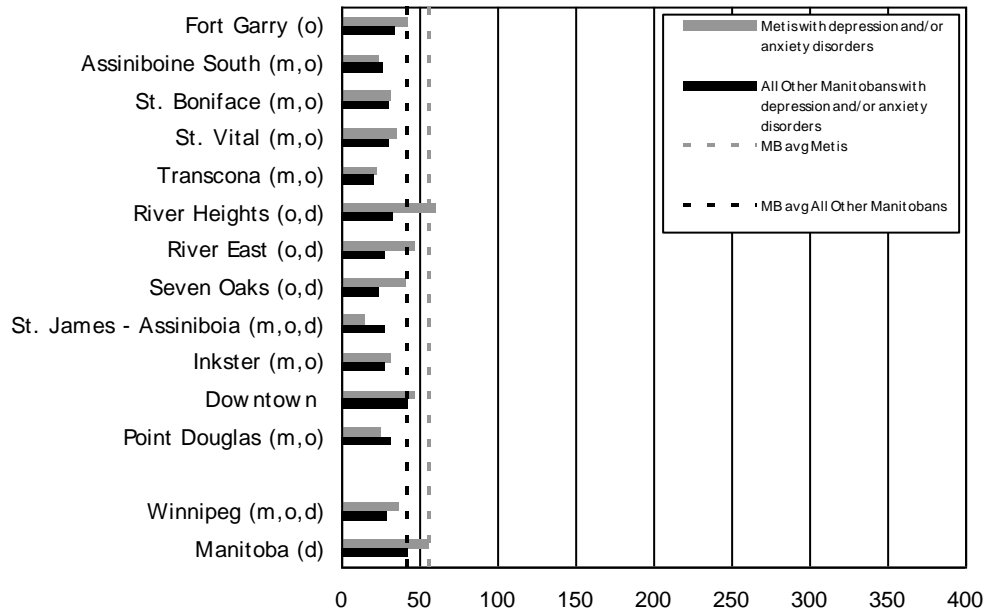


'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 5.5.2: Hospital Separation Rate due to Depression and/or Anxiety Disorders by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of hospital separations per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

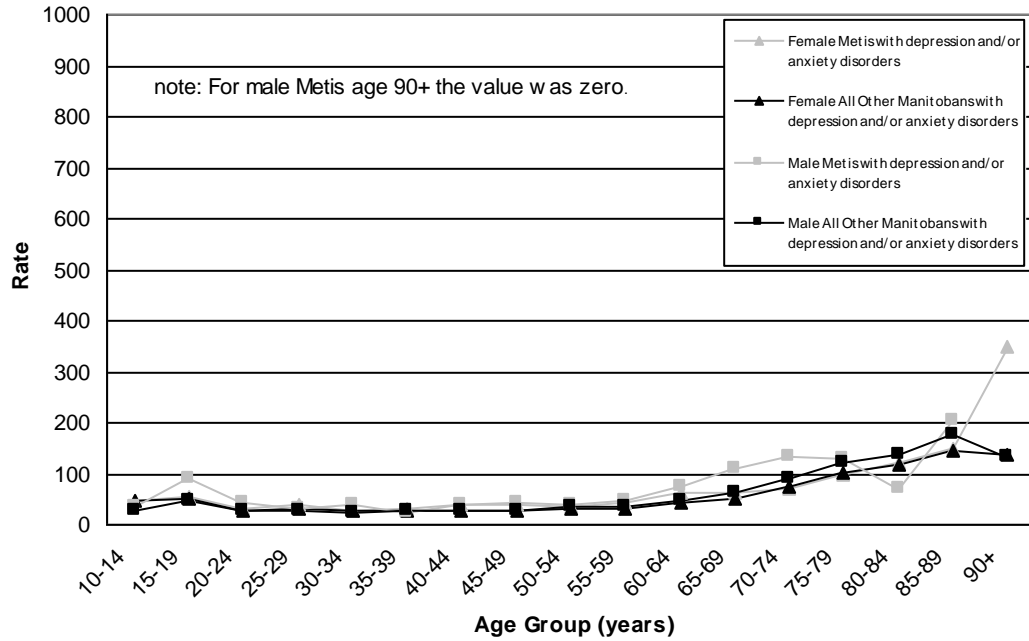
Age- and Sex-Specific:

Manitoba (Figure 5.5.3):

- Crude hospital separation rate due to depression and/or anxiety disorders for Metis males and Metis females remains constant throughout their lives.
- Throughout most of their lives, Metis males and females have a similar crude hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitoban males and females, respectively
- Metis males and Metis females have a similar crude hospital separation rate due to depression and/or anxiety disorders throughout their lives

Figure 5.5.3: Hospital Separation Rate due to Depression and/or Anxiety Disorders in Manitoba by Age and Sex of Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Crude annual rate of hospital separations per 1,000 residents aged 10+ years



Source: MMF, 2013

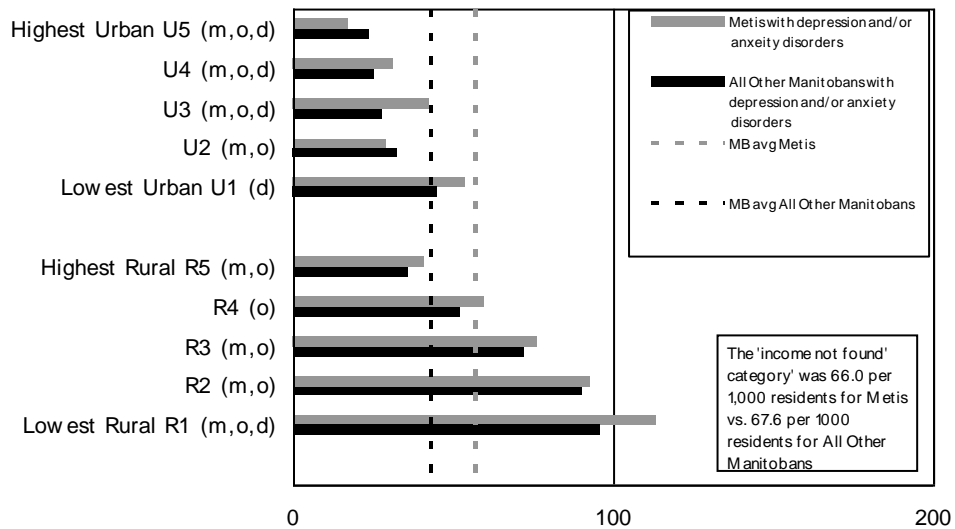
Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 5.5.4):

- **Urban:** Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in U4 (31.1 vs. 24.8 separations per 1,000 residents), U3 (42.3 vs. 27.8), and U1 (53.7 vs. 45.1), whereas they have a lower hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in U5 (17.0 vs. 23.6)
- Metis have a lower hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in U5 (17.0 vs. 56.6 separations per 1,000 residents), U4 (31.1 vs. 56.6), U3 (42.3 vs. 56.6), and U2 (28.9 vs. 56.6)
- All Other Manitobans have a lower hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in U5 (23.6 vs. 42.9 separations per 1,000 residents), U4 (24.8 vs. 42.9), U3 (27.8 vs. 42.9), and U2 (32.2 vs. 42.9)
- **Rural:** Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in R1 (112.8 vs. 95.3 separations per 1,000 residents)
- Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in R3 (76.0 vs. 56.6 separations per 1,000 residents), R2 (92.6 vs. 56.6), and R1 (112.8 vs. 56.6), whereas they have a lower hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in R5 (40.7 vs. 56.6)
- All Other Manitobans have a higher hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in R4 (51.6 vs. 42.9 separations per 1,000 residents), R3 (72.1 vs. 42.9), R2 (90.2 vs. 42.9), and R1 (95.3 vs. 42.9), whereas they have a lower hospital separation rate due to depression and/or anxiety disorders compared to their provincial average in R5 (35.6 vs. 42.9)
- **Income not found:** There is no difference in the hospital separation rate due to depression and/or anxiety disorders between Metis and All Other Manitobans (66.0 vs. 67.6 separations per 1,000 residents)
- **Linear Trend:** There is a trend of increase in the hospital separation rate due to depression and/or anxiety disorders with the decrease of neighborhood income quintiles. This trend is consistently present in urban and rural Metis as well as urban and rural All Other Manitobans

Figure 5.5.4: Hospital Separation Rate due to Depression and/or Anxiety Disorders in Manitoba by Income Quintile of Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted annual rate of hospital separations per 1,000 residents aged 10+ years



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results

Urban Metis: Significant (p < 0.001) Urban All Other Manitobans: Significant (p < 0.001)
 Rural Metis: Significant (p < 0.001) Rural All Other Manitobans: Significant (p < 0.001)

Findings from Literature Review

(Compared to the results in this study – *in italics*):

There are no known comparative studies on hospital separation rates due to depression and/or anxiety disorders for Metis with depression and/or anxiety disorders.

This study shows that Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans provincially, and in the Mid aggregate area. Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in several RHAs including Brandon, Winnipeg, Interlake, Parkland, and Churchill, with a lower rate seen in North Eastman RHA. Within Winnipeg, Metis have a higher rate compared to All Other Manitobans in River Heights, River East, and Seven Oaks Winnipeg CAs.

Among income quintiles, Metis have a higher hospital separation rate due to depression and/or anxiety disorders compared to All Other Manitobans in U4, U3, U1, and R1. In both urban and rural Metis, there is an increasing linear trend for the hospital separation rate due to depression and/or anxiety disorders as neighborhood income quintiles decrease.

Higher rates of hospital separation due to depression and/or anxiety disorders in Metis compared to All Other Manitobans highlight the need for further investigation to understand the underlying factors.

5.6 Antidepressant Use

Antidepressants are a subgroup of medications used to treat individuals with depression (World Health Organization [WHO] Collaborating Centre for Drug Statistics Methodology, 2011). Some antidepressant medications are also prescribed for a number of anxiety disorders, various pain syndromes, sleeplessness, and other health issues (Beck et al., 2005; Raymond, Morgan, & Caetano, 2007).

Both the age- and sex-adjusted, and the age- and sex-specific, percentage of residents with depression and/or anxiety disorders aged 10 years and older with at least two prescriptions for any kind of antidepressant (ATC code N06A) were measured in fiscal year 2006/07. Rate of prescription of antidepressants is an indicator used to define the percentage of Metis and All Other Manitobans who have been prescribed *and filled* at least two prescriptions of antidepressants. The denominator includes the total number of each of Metis and All Other Manitoban populations with depression and/or anxiety disorders aged 10 years and older who were continuously registered with Manitoba Health for at least one year in the five-year period. For example, to calculate the prevalence of antidepressant use among Metis, the denominator is the total number of Metis population with depression and/or anxiety disorders aged 10+ years.

Key observations:

Metis and All Other Manitobans with depression and/or anxiety disorders

Manitoba (Figure 5.6.1):

- Metis have a similar rate of prescription⁴ of antidepressants compared to All Other Manitobans in Manitoba (29.4% vs. 30.1%)

Aggregate areas (Figure 5.6.1):

- There is no difference in the rate of prescription of antidepressants between Metis and All Other Manitobans at the aggregate level
- Metis have lower rate of prescription of antidepressants compared to their provincial average in North aggregate area (26.2% vs. 29.4%)
- All Other Manitobans have a higher rate of prescription of antidepressants compared to their provincial average in Rural South aggregate area (37.0% vs. 30.1%), whereas they have a lower rate of prescription of antidepressants compared to their provincial average in North aggregate area (28.7% vs. 30.1%)
- There is no gradient for the rate of prescription of antidepressants in Metis or All Other Manitobans across the aggregate areas as ordered by PMR

RHAs (Figure 5.6.1):

- There is no difference in the rate of prescription of antidepressants between Metis and All Other Manitobans at the RHA level
- There is no gradient for the rate of prescription of antidepressants in Metis and All Other Manitobans at the RHA level

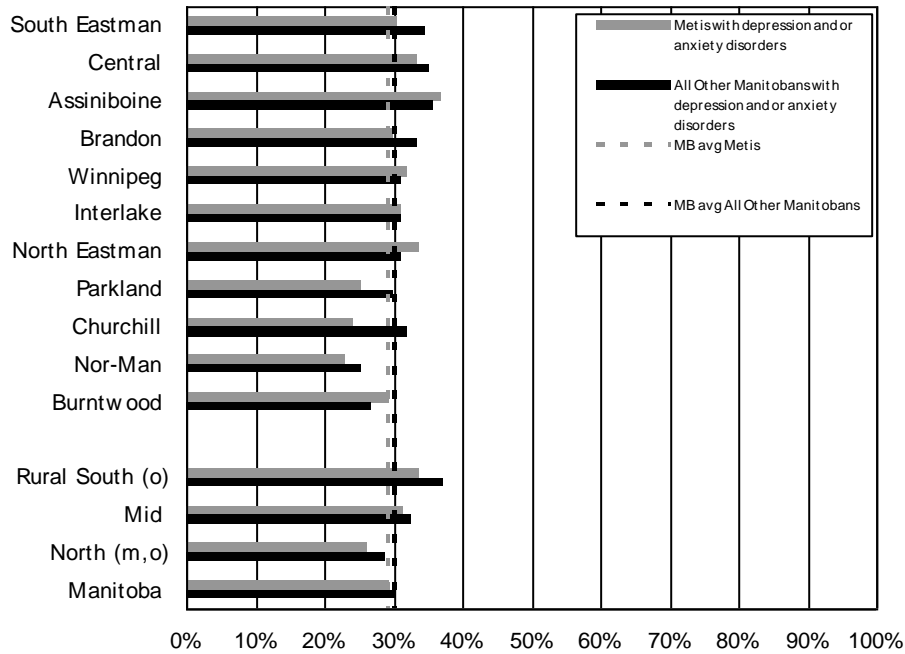
⁴ Rate of prescription refers to prescriptions filled

Winnipeg CAs (Figure 5.6.2):

- There is no difference in the rate of prescription of antidepressants between Metis and All Other Manitobans at the Winnipeg CAs level
- There is no gradient for the rate of prescription of antidepressants in Metis and All Other Manitobans at the Winnipeg CAs level

Figure 5.6.1: Rate of Prescription of Antidepressants by RHA for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years with ≥ 2 prescriptions of antidepressants in one year

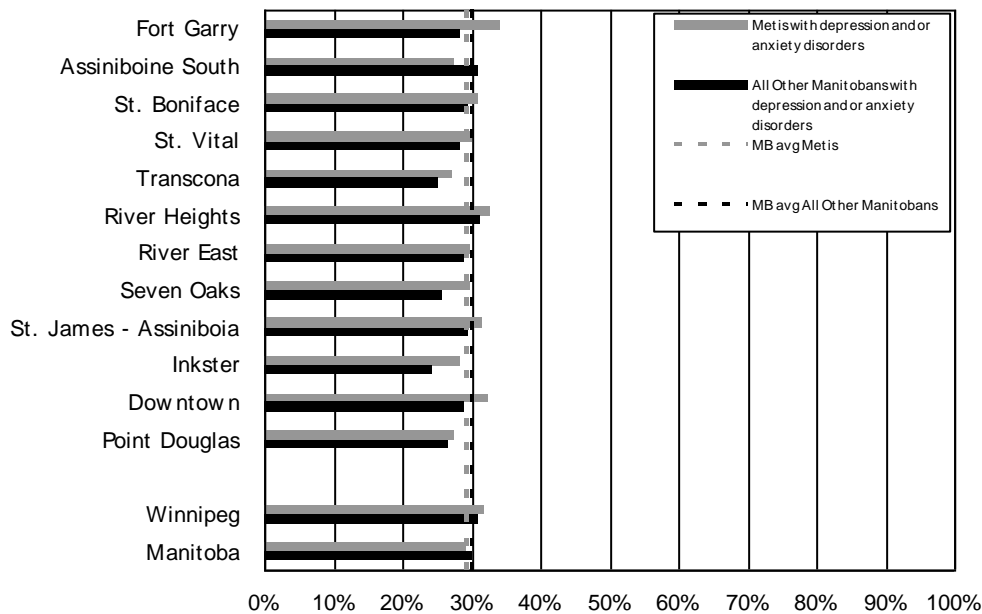


'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Figure 5.6.2: Rate of Prescription of Antidepressants by Winnipeg Community Area for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years with ≥ 2 prescriptions of antidepressants in one year



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

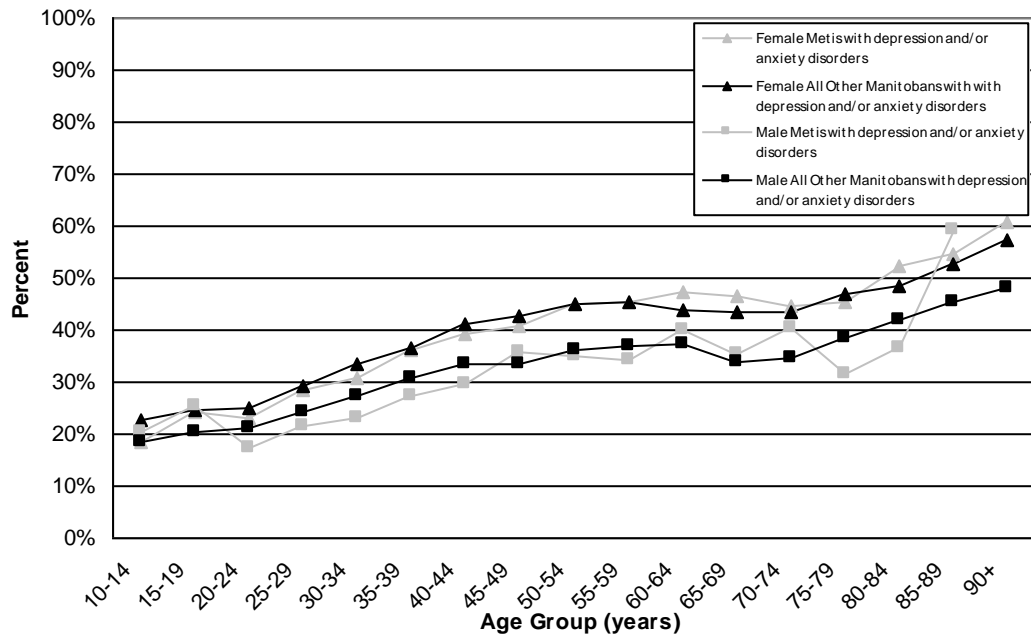
Age- and Sex-Specific:

Manitoba (Figure 5.6.3):

- The crude rate of prescription of antidepressants increases with age for both Metis males and Metis females
- Throughout most of their lives, Metis males and Metis females have a similar crude rate of prescription of antidepressants compared to All Other Manitoban males and All Other Manitoban females, respectively
- Metis males have a lower crude rate of prescription of antidepressants compared to Metis females

Figure 5.6.3: Rate of Prescription of Antidepressants in Manitoba by Age and Sex for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Crude percent of residents aged 10+ years with two or more prescriptions of antidepressants in one year



Source: MMF, 2013

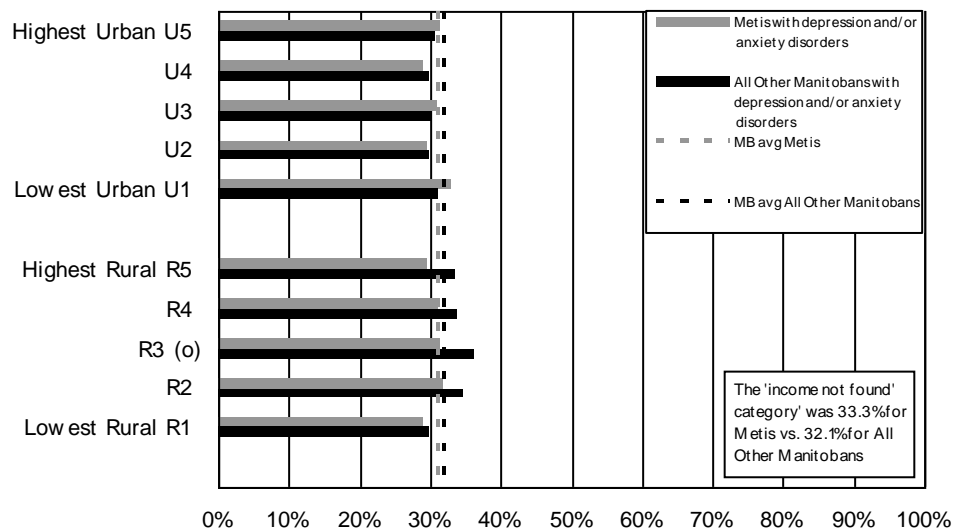
Age- and Sex-Adjusted Income Quintiles:

Manitoba (Figure 5.6.4):

- **Urban:** There is no difference between urban Metis and urban All Other Manitobans in any of the income quintiles as regards to the rate of prescription of antidepressants
- **Rural:** All Other Manitobans have a higher percentage of prescribed antidepressants than their provincial average in R3 (36.4% vs. 32.0%)
- **Income not found:** Metis have a similar percentage of prescribed antidepressants compared to All Other Manitobans (33.3% vs. 32.1%)
- **Linear trend:** For urban and rural Metis, there is no trend for the rate of prescription of antidepressants across the neighbourhood income quintiles. For urban and rural All Other Manitobans, the rate of prescription of antidepressants increases as neighbourhood income quintiles decrease

Figure 5.6.4: Rate of Prescription of Antidepressants by Income Quintile in Manitoba for Metis and All Other Manitobans with Depression and/or Anxiety Disorders, 2002/03-2006/07

Age- and sex-adjusted percent of residents aged 10+ years with two or more prescriptions for antidepressants in one year



'm' indicates the area rate for Metis with depr/anx was statistically different from the Manitoba average for Metis with depr/anx
 'o' indicates the area rate for All Other Manitobans with depr/anx was statistically different from the Manitoba average for All Other Manitobans with depr/anx
 'd' indicates the difference between the two groups' rates was statistically significant for this area
 's' indicates data suppressed due to small numbers (five or fewer cases)

Source: MMF, 2013

Linear Trend Test Results

Urban Metis: Not Significant Urban All Other Manitobans: Significant (p < 0.001)
 Rural Metis: Not Significant Rural All Other Manitobans: Significant (p < 0.001)

Findings from Literature Review

(Compared to the results in this study – *in italics*):

The efficacy of antidepressant medications in the treatment of depression, and in some cases of anxiety disorders, has been clearly demonstrated (CPA, 2006; Kennedy, Lam, Cohen, Ravindran, & the CANMAT Depression Work Group, 2001). However, a recent study using results from the 2002 Canadian Community Health Survey (CCHS) found that half (52.3%) of Canadians aged 15 years and older who were using antidepressants had no lifetime history of a major depressive episode (MDE) (Beck et al., 2005). Additionally, in that study 40.7% of individuals taking antidepressants without a MDE in the previous year had no plausible indications for these medications. For this reason, measures of antidepressant use in the general population are probably not useful indicators of public health progress against depression (Beck et al., 2005). For individuals with depression and/or anxiety disorders specifically, antidepressants are essential treatment for either or both conditions (Beck & Patten, 2004; Zohar & Westenberg, 2000).

Prescription of antidepressants in Canada has increased dramatically in recent decades. The National Population Health Survey (NPHS) found that the proportion of individuals, aged 15 years and older, who were diagnosed with MDE and treated with antidepressants, was doubled from less than 15% to 30% (Patten, 2004). Antidepressant prescription rate increased more than 20% between 2000/01 and 2005/06 in the general Manitoba population, with at least 7.5% of Manitobans of all ages using an antidepressant in the 2005/06 fiscal year (Fransoo et al., 2009). However, this should not be used as evidence of better utilization of mental health services than in the past, as antidepressants may be currently prescribed by physicians more often than they were in the past (Patten & Jubu, 2008). It is also important to note that antidepressant prescription rate should not be used to know the rate of depression in a population as some of patients with MDE are treated with psychotherapy while others overcome their depression by self-power without use of antidepressants (Beck et al., 2005). However, there is a significant evidence that rates of use of antidepressants are much higher in individuals with severe forms of depression or comorbid depression and anxiety disorders than in those with depression alone (Parikh, Lesage, Kennedy, & Goering, 1999).

Information related to antidepressant prescription rate among Metis is limited. In the Metis Atlas, Metis of all ages were more likely than All Other Manitobans to have two or more prescriptions for antidepressants provincially (8.9% vs. 8.0%); in Assiniboine (9.9% vs. 8.5%), Winnipeg (10.0% vs. 7.9%), and North Eastman (9.1% vs. 7.3%) RHAs, as well as in every Winnipeg CA except Assiniboine South (Martens, Bartlett, et al., 2010).

Results from the 2002 CCHS indicate that, for the general population of Canada aged 15 years and older, individuals in the lowest income group have higher rates of antidepressant use than those in the highest income group (Beck et al., 2005). However, in a recent study of Manitobans aged 10 years and older this was only evident in urban areas. In rural Manitoba antidepressant use appeared to increase with income (Fransoo et al., 2009).

There is no known information related to the association of income with antidepressant use in the Metis population. Fransoo et al. (2005) have demonstrated that females administered antidepressants nearly twice as often as males in the general population of all ages in 2003/04 in Manitoba. For the general Canadian population aged 15 years and older, the rates of a past-year MDE were very similar in both sexes; however, females were 1.3 times as likely as males to use antidepressant medications (Beck et al., 2005). There is evidence that this odds ratio used to be much higher in the past. For instance, in the NPHS of 1994/95, females were administered antidepressants 2.5 times the rate in males. This ratio dropped to 1.2 in the 2000/01 NPHS denoting a diminished gap between females

and males in the rate of antidepressants use. This change in the gap could be either due to lowering of the rates of antidepressants use among females or because of dramatic increase in the same rate among males (Patten, 2004).

Results from the 2002 CCHS indicate that antidepressant use in Canadians with a past-year MDE aged 15-25 years was lower than for those aged 26-45 and 46-64 years (Beck et al., 2005). However, in the 2000/01 NPHS there was no significant difference between the two groups (Patten, 2004). In both studies, after adjusting for other factors, Canadians with a past-year MDE in the older age groups were more likely to use antidepressants than were those in younger age groups. In Manitoba in 2003/04, antidepressant use increased with age for both sexes (Fransoo et al., 2005). There is no information available related to age and antidepressant use in the Metis population.

There are no comparable studies in the Metis population on prescription rate of antidepressants. In our study, there is no difference in the prescription rate of antidepressants between Metis and All Other Manitobans provincially, in aggregate areas, RHAs, or in Winnipeg CAs. The rate of prescription of antidepressants increases with age in both Metis males and Metis females.

Although there are higher rates of depression and anxiety disorders in Metis than in All Other Manitobans, no difference between them was observed in the rate of filled prescriptions of antidepressants. Further investigations are needed to examine this paradox. The higher rates of use of antidepressants in elderly Metis (over 50% for those over the age of 80+) suggest the need for further investigation of their experiences.

References

- Aina, Y., & Susman, L.J. (2006). Understanding comorbidity with depression and anxiety disorders. *Journal of American Osteopath Association, 106*(Suppl 2), S9-S14.
- Beck, C. A., Patten, S. B., Williams, J. V. A., Wang, J. L., Currie, S. R., Maxwell, C. J., & El-Guebaly, N. (2005). Antidepressant utilization in Canada. *Social Psychiatry and Psychiatric Epidemiology, 40*(10), 799-807.
- Beck, C. A., & Patten, S. B. (2004). Adjustment to antidepressant utilization rates to account for depression in remission. *Comprehensive Psychiatry, 45*(4), 268-274.
- Bhui, K., & Dinos, S. (2011). Preventative psychiatry: A paradigm to improve population mental health and well-being. *British Journal of Psychiatry, 198*(1), 417-419.
- Canadian Psychiatric Association. (2006). Clinical practice guidelines for the management of anxiety disorders: 2. Principles of diagnosis and management of anxiety disorders. *Canadian Journal of Psychiatry, 51*(Suppl. 2), 7S-8S.
- Enns, M. W., Swenson, J. R., McIntyre, R. S., Swinson, R. P., Kennedy, S. H., & the CANMAT Depression Working Group. (2001). Clinical guidelines for the treatment of depressive disorders: VII. Comorbidity. *Canadian Journal of Psychiatry, 46*(Suppl. 1), 77S-90S.
- Fransoo, R., Martens, P., Burland, E., The Need to Know Team, Prior, H., & Burchill, C. (2009). *Manitoba RHA Indicators Atlas*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Fransoo, R., Martens, P., The Need to Know Team, Burland, E., Prior, H., Burchill, C., ... & Walld, R. (2005). *Sex differences in health status, health care use, and quality of care: A population-based analysis for Manitoba's Regional Health Authorities*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Hämäläinen, J., Isometsä, E., Sihvo, S., Pirkola, S., & Kiviruusu, O. (2008). Use of health services for major depressive and anxiety disorders in Finland. *Depression and Anxiety, 25*(1), 27-37.
- Katon, W., Von Korff, M., Lin, E., Lipscomb, P., Russo, J., Wagner, E., & Polk, E. (1990). Distressed high utilizers of medical care: DSM-III-R diagnoses and treatment needs. *General Hospital Psychiatry, 12*(6), 355-362.
- Katzelnick, D. J., Simon, G. E., Pearson, S. D., Manning, W. G., Helstad, C. P., Henk, H. J. ... & Kobak, K. A. (2000). Randomized trial of a depression management program in high utilizers of medical care. *Archives of Family Medicine, 9*(4), 345-351.
- Kennedy, S. H., Lam, R. W., Cohen, N. L., Ravindran, A. V., & the CANMAT Depression Working Group. (2001). Clinical guidelines for the treatment of depressive disorders: IV. Medications and other biological treatments. *Canadian Journal of Psychiatry, 46*(Suppl. 1), 38S-58S.
- Martens, P. J., Bartlett, J., Burland, E., Prior, H., Burchill, C., Huq, S., ... & Baily, A. (2010). *Profile of Metis health status and healthcare utilization in Manitoba: A population-based study*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Martens, P., Fransoo, R., McKeen, N., The Need to Know Team, Burland, E., Jebamani, L., ... & Metge, C. (2004). *Patterns of regional mental illness disorder diagnoses and service use in Manitoba: A population-based study*. Winnipeg, MB: Manitoba Centre for Health Policy.

- Parikh, S. V., Lam, R. W., & the CANMAT Depression Working Group. (2001). Clinical guidelines for the treatment of depressive disorders: I. Definitions, prevalence, and health burden. *Canadian Journal of Psychiatry*, 46(Suppl. 1), 13S-20S.
- Parikh, S. V., Lesage, A. D., Kennedy, S. H., & Goering, P. N. (1999). Depression in Ontario: Under-treatment and factors related to antidepressant use. *Journal of Affective Disorders*, 52(1-3), 67-76.
- Patten, S. B. (2004). Major depression and mental health care utilization in Canada: 1994 to 2000. *Canadian Journal of Psychiatry*, 49(5), 303-309.
- Patten, S., & Juby, H. (2008). *A profile of clinical depression in Canada*. Canadian Research Data Centre Network Synthesis Series: #1. Retrieved from https://dspace.ucalgary.ca/bitstream/1880/46327/6/Patten_RSS1.pdf
- Raymond, C. B., Morgan, S. G., & Caetano, P. A. (2007). Antidepressant utilization in British Columbia from 1996 to 2004: Increasing prevalence but not incidence. *Psychiatric Services*, 58(1), 79-84.
- Tweed, D. L., Goering, P., Lin, E., & Williams, J. I. (1998). Psychiatric morbidity and physician visits: Lessons from Ontario. *Medical Care*, 36(4), 573-585.
- Watson, D.E., Heppner, P., Roos, N.P., Reid, R.J., & Katz, A. (2005). Population-based use of mental health services and patterns of delivery among family physicians, 1992 to 2001. *Canadian Journal of Psychiatry*, 50(7), 398-406.
- WHO Collaborating Centre for Drug Statistics Methodology. (2011). *Guidelines for ATC classification and DDD assignment*. Oslo, Norway: WHO Collaborating Centre for Drug Statistics Methodology.
- Zohar, J., & Westenberg, H.G.M. (2000). Anxiety disorders: A review of tricyclic antidepressant and selective serotonin reuptake inhibitors. *Acta Psychiatrica Scandinavica*, 101(5403), 39-49.

Glossary

Age Linear and Age Quadratic

Age linear and age quadratic are factors that are used in the logistic regression models presented in this research study (see Table: 4.4.1). The age linear factor indicates the relationship between the outcome of interest (e.g., probability of depression) and age of an individual Manitoban (including Metis *and* All Other Manitobans). The age quadratic factor indicates whether the age relationship plateaus at some point; that is, if at some point an increase in age no longer increases or decreases the likelihood of the outcome of interest (e.g., probability of developing depression and/or anxiety disorders) (Martens, Bartlett et al., 2010).

Aggregated Diagnostic Groups (ADG)

Mental illness ADGs and major physical illness ADGs are often used in logistic regression modelling. As noted in Martens, Bartlett, et al. (2010), both categories of ADGs “measure the illness burden (morbidity) of individual patients by grouping individuals based on their age, sex, and all known medical diagnoses assigned by their health care providers over a defined time period (typically one year)” (p. 503). ADGs account for all hospitalizations and physician visits for each Manitoban in a given year. If an individual had a diagnosis for a mental illness or disorder, for example, they are be assigned one of the three mental illness ADGs depending on the severity of their illness. Similarly, if an individual has been diagnosed with an unstable illness (e.g., tuberculosis) or a major illness (e.g., cancer) they are assigned one of the major physical Illness ADGs. For the logistic regression, individuals were classified as having a mental or major physical ADG if they had been assigned at least one of the relevant ADGs. For the most part, the ADGs were identified and assigned in the year prior to the event in the regression (Martens, Bartlett, et al., 2010). Aggregated Diagnosis Groups™ (ADGs™) codes for risk adjustment in logistic models were created using The John Hopkins Adjusted Clinical Group ® (ACG®) Case-Mix System version 9.

All Other Manitobans

All Other Manitobans are all individuals living in a geographical area who were not identified as Metis as identified by the Metis Population Database (Martens, Bartlett et al., 2010).

Average Household Income of Neighborhood

The average household income is the mean income of a household at the neighborhood level from the 2006 Canadian Census (Manitoba Centre for Health Policy, [MCHP], 2010).

Codes for Suicide Completions or Attempts

Vital Statistics death records with self-inflicted injury or poisoning listed as the primary cause of death (ICD–9–CM codes E850–E854, E858, E862, E868, E950–E957, E958.0–E958.9, E959, Y10–Y12, Y16, Y17; ICD–10–CA codes X40–X42, X46, X47, X60–X84)

Hospitalizations with a diagnosis for suicide and self–inflicted injury (ICD–9–CM codes E950–E959, ICD–10–CA codes X60–X84)

Hospitalizations with a diagnosis code for accidental poisoning (ICD–9–CM codes 965, 967, 969, 977.9, 986, E850–E854, E858, E862, E868; ICD–10–CA codes T39, T40, T42.3, T42.4, T42.7, T43, T50.9, T58, X40–X42, X44, X46, X47, Y10–Y12, Y16, Y17) only if there is a physician visit with a diagnosis code for accidental poisoning and a psychiatric tariff code either during the hospital stay or within 30 days post–discharge (8444, 8446, 8472, 8475, 8476, 8503, 8504, 8553, 8554, 8581, 8584, 8588, 8596, 8580, 8587, 8589) (Martens, Bartlett et al., 2010).

Dissemination Areas

A dissemination area can be defined as a small area composed of one or more neighborhood blocks, with a population of 400 to 700 persons used to group individuals to area-level income quintiles (Statistics Canada, 2011).

Factors Influencing Health Status and Contacts

Factors influencing health status and contacts are one of the causes of hospitalization measured in Section 5.4: Hospital Separations by Cause. This classification includes physician visits not recorded as ‘diagnoses’ (i.e., not included in the ICD-9 categories). It is used when a person who is not sick is hospitalized (e.g., to donate an organ or tissues or to receive a prophylactic vaccination) or when a person returns to the hospital for specific treatment of a known disease or injury (e.g., dialysis, chemotherapy, or a cast change) (Martens, Bartlett et al., 2010).

International Classification of Disease (ICD)

The ICD is a classification system of medical diagnoses of diseases, symptoms, injuries, and other health problems used internationally by clinicians, health managers, and epidemiologists. The World Health Organization developed the ICD. In this report ICD codes from version 9 and 10 are used (WHO, 2011).

Income Quintiles

Income quintiles are divided into five categories for urban and rural populations. These include: urban 1 (U1), urban 2 (U2), urban 3 (U3), urban 4 (U4), and urban 5 (U5) and rural 1 (R1), rural 2 (R2), rural 3 (R3), rural 4 (rural 4), rural 5 (R5) (with 20% of the population in each category). There are five urban income quintile groupings and five rural income quintile groupings, each is ranked from poorest to wealthiest (1=poorest, 5=wealthiest). Urban income quintiles include all those living in Winnipeg or Brandon and rural income quintiles include all other areas living in rest of Manitoba. The income quintiles are derived from Statistics Canada Census data, in which data are aggregated and designated into a dissemination area (DA) level average household income. Each DA are “attributed” an average household income to reflect area income as opposed to individual income (Manitoba Centre for Health Policy, 2011; Martens et al., 2004).

Income Not Found

A group of individuals who were not captured through the Statistics Canada census data. These individuals cannot be assigned to an income quintile category because they are in an institution, or in jail, or they are without a permanent address. These areas can include

residents of long-term care facilities, residents of some personal care homes, residents of psychiatric facilities, federal and long-term prisoners, wards of Public Trustee, Child and Family Services, residents of various areas reporting no income in the census, and dissemination areas (DA) with populations less than 250 persons (Manitoba Centre for Health Policy, 2006a).

Linear Trend Test

Linear trends are identified through testing the association between indicator values (e.g. Metis with depression and/or anxiety disorders) and area-level income data (e.g. rural Metis). In this study, a linear trend test was done by fitting a regression line to the crude rate with the income quintile and age as the independent variables. The value to the resulting coefficient for the income quintile variable denoted the magnitude of the trend (i.e. the larger the coefficient gives the direction of the trend (i.e. increasing if positive and decreasing if negative). The rural and urban income quintiles were run separately for both Metis and All Other Manitobans (Manitoba Centre for Health Policy 2006b; Martens et al., 2004).

Manitoba Metis Federation (MMF) Membership

At the MMF, Metis identity is verified by self-identification, Metis ancestry, and community acceptance through membership application and a confirmation process. Through a genealogy with supporting evidentiary documents, an individual and his or her family are able to determine whether or not a Metis ancestral connection can be established. Supporting evidentiary documents many include Federal Census records, sacramental records, Manitoba and Northwest scrip affidavits, post records and journals. All individuals seeking membership in the MMF are required to have a genealogy completed by a recognized institution in order to objectively verify the applicant's historic Metis nation ancestry. Application for membership begins at the receiving Local in the area in which an individual resides (Manitoba Metis Federation, 2010).

Metis

The Metis are descendents of early 17th-century relationships between North American Indian and Europeans (Sprague & Frye, 1993). The Metis coalesced into a distinct nation in Manitoba in the late 18th century. After the 1885 fall of Batoche, "Metis were denied a separate identity and ignored for a century" (McMillan, 1995, pp.312-313). By the 1967, with formation of the Manitoba Metis Federation, the Metis in Manitoba were again asserting their capacity to advocate and function once more in a collective manner. In the 1982 amendment to the Canadian Constitution Metis were named as one of the three Aboriginal peoples of Canada (Government of Canada, 1982).

Mid Aggregate Area

Mid aggregate area is one of three rural aggregate areas in Manitoba. It includes the rural RHAs of central Manitoba: Parkland, Interlake, and North Eastman RHAs (see Figure 1.5.1: Geographical distribution of the MMF Regions, RHAs, and Winnipeg CAs) (Martens, Bartlett et al., 2010).

Most Responsible Diagnosis

The most responsible diagnosis is the single diagnosis that best accounts for a patient's stay in the hospital. When more than one diagnosis may be assigned to a patient, the one deemed as the cause of the longest hospital stay is considered 'most responsible' (Manitoba Centre for Health Policy [MCHP], 2007).

North Aggregate Area

North aggregate area is one of three rural aggregate areas in Manitoba. It includes the rural RHAs of northern Manitoba: Nor-Man, Burntwood, and Churchill RHAs (see Figure 1.5.1: Geographical distribution of the MMF Regions, RHAs, and Winnipeg CAs) (Martens, Bartlett et al., 2010).

Premature Mortality Rate (PMR)

PMR is defined as the number of deaths occurring before age 75, and is usually described as the age-adjusted number of deaths per 1,000 persons under the age of 75. PMR is one of the most commonly used indicators in a public health research. This is because it provides an overall indication of population health which can be easily compared with many health indicators (Eyles & Birch, 1993).

Premature Mortality Rate (PMR) gradient:

Throughout this report, the RHAs and Winnipeg CAs in the graphs are ordered by ten-year premature mortality rate (PMR). In each graph PMR increases from top to bottom, with the most healthy areas at the top of the graph and the least healthy areas at the bottom. This gradual slope of increasing PMR is referred to as the PMR gradient. It is expected that many indicators of morbidity, mortality, and health services use will reflect this PMR gradient, increasing from top to bottom of each graph (Martens, Bartlett et al., 2010).

Rural South Aggregate Area

Rural South aggregate area is one of three rural aggregate areas in Manitoba. It includes the rural RHAs of southern Manitoba: Assiniboine, Central, and South Eastman RHAs (see Figure 1.5.1: Geographical distribution of the MMF Regions, RHAs, and Winnipeg CAs) (Martens, Bartlett et al., 2010).

Vital Statistics

Vital Statistics is an agency of the provincial government that maintains records of key life events, including births, stillbirths, marriages, name changes, and deaths in Manitoba. Access to these records is limited by provincial privacy legislation (Vital Statistics Agency, n.d.).

Winnipeg Average Health

Winnipeg Average Health is one of the three aggregate geographical areas in Winnipeg. It includes all Winnipeg Neighborhood Clusters with a PMR statistically similar to the PMR for Winnipeg overall in the 1996-2005 period: River Heights East, Seven Oaks North, Seven Oaks East, Seven Oaks West, St. Vital North, and Transcona (Martens, Bartlett, et al., 2010).

Winnipeg Least Healthy

Winnipeg Least Healthy is one of the three aggregate geographical areas in Winnipeg. It includes all Winnipeg Neighborhood Clusters with a PMR statistically lower than the PMR for Winnipeg overall in the 1996-2005 period: Downtown East, Downtown West, Inkster East, Point Douglas North, Point Douglas South, River East South, St. Boniface West, and St. James – Assiniboia East (Martens, Bartlett, et al., 2010).

Winnipeg Most Healthy

Winnipeg Most Healthy is one of the three aggregate geographical areas in Winnipeg. It includes all Winnipeg Neighborhood Clusters with a PMR statistically higher than the PMR for Winnipeg overall in the 1996-2005 period: Assiniboine South, Fort Garry North, Fort Garry South, Inkster West, River East North, River East, River East West, River Heights West, St. Boniface East, St. James – Assiniboia West and St. Vital South (Martens, Bartlett, et al., 2010).

References

- Eyles, J., & Birch, S. (1993). A population needs-based approach to health-care resource allocation and planning in Ontario: A link between policy goals and practice? *Canadian Journal of Public Health*, 84(2), 112-117.
- Government of Canada. (1982). *Constitution Act: Section 35*. Retrieved June 17, 2011 from http://laws.justice.gc.ca/eng/Const/page-12.html#anchors:7-bo-ga:l_II
- Manitoba Centre for Health Policy. (2006a). *Glossary definition: Income not found*. Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=102883>
- Manitoba Centre for Health Policy. (2006b) *Glossary definition: Linear trend test*. Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=102973>
- Manitoba Centre for Health Policy. (2007). *Glossary definition: Most responsible diagnosis*. Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=103120>
- Manitoba Centre for Health Policy. (2008). *Glossary definition: Shadow billing*. Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=103569>
- Manitoba Centre for Health Policy. (2010). *Glossary definition: Term: Average household income (neighborhood income)*. Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=104067>
- Manitoba Centre for Health Policy. (2011). *Glossary definition: Income quintile*. Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=102882>
- Manitoba Metis Federation. (2010). *Membership application and confirmation package*. Retrieved Sept 30, 2010 from http://mmf.mb.ca/images/pdf/membership/mmf_membership_package.pdf
- Martens, P.J., Bartlett, J., Burland, E., Prior, H., Burchill, C., Huq, S., Romphf, L., Sanguins, J., Carter, S., & Bailly, A. (2010). *Profile of Metis health status and healthcare utilization in Manitoba: A population-based study*. Winnipeg, MB: Manitoba Centre for Health Policy.
- Martens, P.J., Fransoo, R., McKeen, N., The Need to Know Team., Burland, E., Jebamani, L., ...& Metge, C. (2004). *Patterns of regional mental illness disorder diagnoses and service use in Manitoba: A population-based study*. Winnipeg, Mb. Retrieved from <http://mchp-appserv.cpe.umanitoba.ca/reference/mental.health.pdf>
- McMillan, A.D. (1995). *Native peoples and cultures of Canada*. Toronto, ON: Douglas & McIntyre.
- Sprague, D.N., & Frye, R. P. (1983). *The genealogy of the first Metis nation: The development and dispersal of the Red River Settlement, 1820-1900*. Winnipeg, MB: Pemmican Publications.
- Statistics Canada. (2011). Dissemination area (DA). Retrieved from <http://www12.statcan.ca/english/census01/Products/Reference/dict/geo021.htm>
- Vital Statistics Agency. (n.d.). *What we do*. Retrieved January 31, 2011, from <http://vitalstats.gov.mb.ca/>
- World Health Organization. (2011). *Classifications: International Classification of Diseases (ICD)*. Retrieved from <http://www.who.int/classifications/icd/en/>